2016 Substantial Conformance Review for Individual Maintenance Plan (IMP) and Individual Technical Assessments for Tijuana River Pilot Channel and Smuggler's Gulch, City of San Diego Site Development Permit No. 1134892, Master Storm Water System Maintenance Program

Appendix A

Individual Hydrologic and Hydraulic Assessment (IHHA)

RICK
ENGINEERING COMPANY

June 16, 2016

Traffic and Storm Water Department
City of San Diego
2781 Caminito Chollas
San Diego, California 92105

SUBJECT: CITY OF SAN DIEGO CHANNEL MAINTENANCE FOR 2016 – INDIVIDUAL HYDROLOGIC AND HYDRAULIC ASSESSMENT (IHHA) REPORT FOR TIJUANA RIVER PILOT CHANNEL AND SMUGGLER'S GULCH CHANNEL (RICK ENGINEERING COMPANY JOB NUMBER 17204-C)

To Whom It May Concern:

The Tijuana River Pilot (Pilot) Channel and Smugglers Gulch (SG) Channel, as part of the Master Storm Water System Maintenance Program were both last maintained in 2015. The maintenance conducted included sediment and vegetation removal in the Smugglers Gulch Channel, the area around the confluence of the Pilot Channel and SG Channel, and the portion of the Pilot Channel around the Hollister Street Bridge Crossing (See Appendix B for locations of maintenance). The letter in Appendix A was used to justify the 2015 proposed maintenance, and describes the recommended removal amount and limits of sediment and vegetation. The proposed 2015 maintenance was not completed during the 2015 maintenance activities.

This letter is intended to serve as an update to the 2015 letter, in Appendix A, and retain its validity in 2016. A site visit of the Pilot and SG Channels was conducted by Rick Engineering Company Staff on May 5, 2016 (See Appendix C for Photos of the Site Visit). The determination was made that the observations of the hydraulic characteristics of both channels are similar to the conditions described in the 2015 letter. As such, the contents and recommendations are still valid for the letter in Appendix A.

The following appendices are provided for reference:

A. City of San Diego Channel Maintenance 2015 – Individual Hydrologic and Hydraulic Assessment (IHHA) Report for Tijuana River Pilot Channel and Smuggler's Gulch Channel
B. 2015 Maintenance Area Exhibit
C. Rick Engineering Site Photos taken on May 5, 2016

Sincerely,

RICK ENGINEERING COMPANY

Jayne Janda-Timba
R.C.E. #70649 Exp. 06/17
Associate

JJT:KA:rf:Reports/17204-C.008

REGISTERED PROFESSIONAL ENGINEER
JAYNE-MARIE JANDA-TIMBA
NO. 70649
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STATE OF CALIFORNIA

Appendix A
City of San Diego Channel Maintenance 2015 – Individual Hydrologic and Hydraulic Assessment (IHHA) Report for Tijuana River Pilot Channel and Smuggler's Gulch Channel

RICK
ENGINEERING COMPANY

July 13, 2015

City of San Diego
2781 Caminito Chollas
San Diego, California 92105

SUBJECT: CITY OF SAN DIEGO CHANNEL MAINTENANCE 2015 – INDIVIDUAL HYDROLOGIC AND HYDRAULIC ASSESSMENT (IHHA) REPORT FOR TIJUANA RIVER PILOT CHANNEL AND SMUGGLER'S GULCH CHANNEL
(RICK ENGINEERING COMPANY JOB NUMBER 17204-C)

To Whom It May Concern:

The Tijuana River Pilot (Pilot) Channel and Smugglers Gulch (SG) Channel, as part of the Master Storm Water System Maintenance Program, are both recommended for sediment and vegetation maintenance. Through maintenance, the Pilot and SG Channels see notable benefits, with respect to drainage.

The City of San Diego developed the Master Storm Water System Maintenance Program to optimize its business processes and environmental protection practices related to channel operation and maintenance activities. The Master Maintenance Program (MMP) is intended to integrate operation and maintenance planning, implementation and assessment activities with its water quality protection programs. This letter provides information regarding maintenance recommendations for the Tijuana River Pilot (Pilot) Channel and Smuggler's Gulch (SG) Channel to be conducted in the second half of 2015.

In 2013 the City of San Diego maintained portions of the two channels following the recommendations of an approved IHHA, prepared by URS Corporation, for the Pilot and SG Channels. The City of San Diego, however, was not able to conduct the full recommended maintenance as specified in the URS IHHA due to conflicts with rain events and standing water. The approved IHHA for the Pilot Channel and SG Channel, dated December 21, 2012, describes the recommended maintenance methods, removal amounts, and maintenance limits (see Attachments 1-4 for the URS IHHA report).

After review of the IHHA prepared by URS Corporation, this letter concludes that the proposed maintenance method, sediment and vegetation removal (See the as-builts in Attachment 6 for the limits and methods of maintenance) for the Pilot Channel and SG Channel are valid for the proposed maintenance in 2015. Rick Engineering Company performed a site visit on April 21, 2015 to view the site conditions for both the Pilot Channel and SG Channel. In comparison to the URS site photos, taken in September

2012, the Rick site photos show similar drainage conditions within both channels (see Attachment 2 for the URS site photos and Attachment 5 for the RICK site photos). These similarities include visible sedimentation and very dense vegetation in the pilot channel, as seen in the pictures of the area in which the Pilot and SG Channels confluence. Despite the maintenance conducted in 2013, the URS and RICK site photos show similar drainage conditions due to the constant sedimentation and vegetation growth throughout the 3 year gap between the site visits. Through this comparison of site conditions, along with preliminary hydraulic analysis, and the best professional judgement from a qualified, registered Civil Engineer it was determined that the URS IHHA's conclusions about recommended maintenance methods are applicable to the proposed maintenance in 2015.

Regarding the maintenance removal amounts and limits, the URS IHHA's recommendations will be slightly modified for the proposed 2015 maintenance. Though permitted, the previous 2013 maintenance under the MMP did not include channel clearing in the project area east of the Hollister Street Bridge, as indicated by the URS IHHA, due to the presence of ponded water. For the proposed 2015 maintenance, the City of San Diego will implement pre-maintenance pumping to dry any ponded water in the eastern portion of the Pilot Channel and allow mechanized equipment use in the channel. The pre-maintenance pumping will likely occur in stages, with the first stage being to pump out the ponded water in the eastern portion of the Pilot Channel both east and west of the Hollister Street Bridge. The pumping process will begin with the placement of a suction hose within the Pilot Channel near Hollister Street Bridge; placing a pump adjacent to the channel and the placing of temporary hoses along the channel bank to a discharge location, likely near the confluence of the Pilot Channel and SG Channel. Critically silenced pumps will be used throughout the project. The second stage would involve a similar set up of equipment placed further downstream to pump water from the confluence, of the Pilot and SG Channels, to the downstream (western) end of the Pilot Channel. Additional pumping may be required if rains occur during the maintenance activities and result in ponded water pools within the work area. As ponded water is removed, City maintenance staff will survey and confirm current elevations along with the amount of accumulated sediment and debris present in the project area east of the Hollister Street Bridge. Based on the modified URS IHHA recommended maintenance amounts and limits, channel clearing to restore the as-built/designed conditions will be conducted.

Maintenance is necessary in order to reduce the effect of flooding and provide more capacity in both the Pilot and SG channels. It is important to note that the Pilot Channel and the SG Channel are designed to work in tandem. In order for the SG Channel to effectively outlet into the Pilot Channel, and consequently the Tijuana River Valley, both channels need to be maintained simultaneously. If only the SG Channel is maintained, and not the Pilot Channel, conveyance through the SG Channel will slow causing sediment to accumulate into the channel, negating the original maintenance.

The following attachments are provided for reference:

1. Tijuana River Pilot and Smuggler's Gulch Channels IHHA report prepared by URS Corporation dated December 21, 2012.
2. Site Photos taken by URS on September 13, 2012.
3. Exhibits for the URS IHHA report.
4. Hydraulic backup data for the URS IHHA report.
5. Rick Engineering Site Photos taken on April 21, 2015.
6. As-built of 2013 maintenance.

Sincerely,

RICK ENGINEERING COMPANY

Jayne Janda-Timba

Jayne Janda-Timba
R.C.E. #70649 Exp. 06/17
Associate

JJT:KA:fm\k\files\text.002

REGISTERED PROFESSIONAL ENGINEER
JAYNE MARIE JANDA-TIMBA
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STATE OF CALIFORNIA

Attachment 1
Tijuana River Pilot and Smuggler's Gulch Channels IHHA Report
Prepared by URS Corporation dated December 21, 2012

INDIVIDUAL HYDROLOGIC & HYDRAULIC (IHHA) ASSESSMENT REPORT

Site Name/Facility:	Tijuana River Pilot and Smuggler's Gulch Channels
Master Program Map No.:	138a-138c & 138-139
Date:	December 21, 2012
Civil Engineer: (name, company, phone number):	Matt Moore URS Corporation 858-812-9292
Registered Civil Engineer Number & Expiration Date (place stamp here):	RCE No. 56780, Exp. 6/30/2013

***Instructions:** This form must be completed for each target facility following the completion of the Individual Maintenance Plan (IMP) report form and prior to any work being conducted in the facility. Attach additional sheets if needed.

EXISTING CONDITIONS

The City of San Diego (City) has developed the Master Storm Water System Maintenance Program (MMP) (City of San Diego 2011a) to govern channel operation and maintenance activities in an efficient, economic, environmentally and aesthetically acceptable manner to provide flood control for the protection of life and property. This document provides a summary of the Individual Hydrologic and Hydraulic Assessment (IHHA) activities conducted within the Tijuana River Pilot (Pilot) Channel and the Smuggler's Gulch (SG) Channel in order to comply with the MMP's Programmatic Environmental Impact Report (PEIR) (City of San Diego 2011b).

The purpose of this report is to assess if the maintenance described in the City's MMP is needed based on a hydrologic and hydraulic assessment. As-built data found on these channels provided information on the channel dimensions; however, little information was obtained on the hydrologic and hydraulic design of the channels. The hydrologic estimations for the channels were based on previous Tijuana River Valley reports that are further discussed in the Hydrologic information section. For the Pilot Channel, an additional analysis was performed to determine the amount of flow that enters the Pilot Channel after the Tijuana River splits into two water conveyance paths approximately 800 feet east of the Hollister Street bridge. The Pilot Channel is considered part of the Southern Channel as described later in this section. These estimates are refered to throughout this report as the estimated storm event flow rate. For the hydrualic design capacity of the channels, the Maintained Condition – Sediment removed section of this report best reflects the intended capacity of the channels as it is based on the MMP channel dimension data. This is refered to as the calculated design capacity throughout this report. To improve channel hydraulics, it was also assumed that the Pilot Channel

EXISTING CONDITIONS

would be maintained in a manner to create a positive slope of 0.04% from the Hollister Bridge to the end of the channel.

Based on this IHHA assessment, both the Pilot Channel and SG Channel do not currently have capacity to convey their original design flows. Maintenance of the Pilot Channel and SG Channel is needed to restore the channels' flood conveyance capacity to their original design condition. The current capacity of the Pilot Channel is at 5% of its calculated design capacity due to sedimentation. The SG Channel is at 73% of its calculated design capacity due to sedimentation. Tables ES-1 and ES-2 summarize the results for each channel. It is recommended that both channels be excavated to their original design depths and widths to reduce the flooding impacts created by the sedimentation within the channels. For the Pilot Channel maintenance would generally consist of trash and vegetation clearing and excavation of approximately 2 to 7 feet over its length. For the SG Channel maintenance would generally consist of trash and vegetation clearing and excavation of approximately 2 to 3 feet over its length.

Table ES-1. Pilot Channel Results Summary

Storm Event	Estimated Storm Event Flow Rate (cfs)	Calculated Design Capacity1 (cfs)	Current Capacity (cfs)
2-year	278	200	10

[1] Based upon MMP channel dimensions

Table ES-2. SG Channel Results Summary

Storm Event	Estimated Storm Event Flow Rate (cfs)	Calculated Design Capacity (cfs)1	Current Capacity (cfs)
2-year	653	900	653
5-year	1,479	900	800

[1] Based upon MMP channel dimensions

EXISTING CONDITIONS

Description of creek/channel (limits of reach, surrounding land use and area, creek/channel geometry and vegetative condition):

The channels associated with this assessment report are located in the Tijuana River Valley (Valley), within the jurisdiction of the City of San Diego (City). The Tijuana River watershed covers an area of approximately 1,725 square miles, of which 73 percent is located in Mexico and 27 percent in the United States. The main Tijuana River flows in a northwesterly direction from the international border into the Valley and City jurisdiction. Approximately 21.9 square miles of the watershed (~1% of the total watershed area) is within City jurisdiction.

The Tijuana River National Estuarine Research Reserve (TRNERR) and a portion of the City of Imperial Beach are generally west of the project area located adjacent to the Tijuana River's discharge to the Pacific Ocean. The Otay-Nestor community and the United States Naval Outlying Landing Field Imperial Beach are located north of the project area; and the community of San Ysidro is located to the east.

The Pilot Channel is included on MMP Maps 138a through 138c and the SG Channel is included on MMP Maps 138 and 139 (City of San Diego 2011a). The Pilot and SG Channels are generally located in the Valley roughly bordered by Hollister Street to the east and Monument Road to the south. The Tijuana River low flow channel splits into what are commonly referred to as the Tijuana River's Northern and Southern Channels approximately 800 feet east of Hollister Street. The Pilot Channel follows the Southern Channel.

The Valley, including the project area, is within the Federal Emergency Management Agency's (FEMA) Special Flood Hazard Areas Subject to Inundation by the 1-percent Annual Chance Flood (100-year floodplain). The project areas are zoned OF-1-1 (Open Space-Floodplain) and AR-1-1 (Agricultural/Residential); and are designated for Open Space and Agricultural land uses in the Tijuana River Valley Land Use Plan. In addition, the project area is within the boundaries of the County of San Diego's 2.7 square mile Tijuana River Valley Regional Park (Regional Park). The project area is also within the City's Multiple Species Conservation Program's Multi-Habitat Planning Area (MHPA).

The project consists of maintenance and dredging of the Pilot and SG Channels to remove anthropogenic-derived sediment and trash that accumulates as a result of development and other practices in the upstream watershed. The removal of sediment and trash is conducted to maintain flow conveyance capacities and reduce the risk of flooding to public and private infrastructure in the Valley.

<u>Pilot Channel</u>

EXISTING CONDITIONS

The Pilot Channel was originally excavated in 1993 within the Southern Channel. It is has been irregularly maintained since that time as an earthen trapezoidal channel that is approximately 5 feet deep, with a 23-foot top width, and a 15-foot streambed width. According to the MMP, the Pilot Channel was constructed to divert wet-weather flows from 2- to 5-year storm events into the Southern Channel (City of San Diego 2011b). The Pilot Channel stretches from 100 feet east to 5,300 feet west of Hollister Street for a total length of 5,400 feet and it flows roughly in an east-west direction. Figures 2 and 3 show the location of the Pilot Channel.

A site visit was conducted on September 13, 2012 to evalulate the current channel conditions from a hydrologic and hydraulic perspective. Due to high vegetation density, the current conditions of the Pilot Channel were not able to be thorougly assessed during the project site visit because of lack of access and visibility. Two locations did provide limited vantage view points to assess the channel's existing conditions. One location was the Hollister Street bridge. The view from the Hollister Street bridge was blocked by tall, dense vegetation beyond a distance of approximately 300 feet upstream and 100 feet downstream. From the bridge, it was observed that the width of the ponded water in the channel was approximately 38 feet with no vegetation in the ponded water areas. It was not reasonably feasible to measure the channel depth, ponded water depth, and sediment deposition depth. Significant trash and debris were not observed along this section of the channel (see Photo No. 1 through 6).

The second observation location was the confluence point of the Pilot and SG Channels (see Photo No. 7 through 14). Limited access to the Pilot Channel was possible at this location via an existing trail/access route from Saturn Boulevard; however, the areas of the Pilot Channel beyond this crossing, upstream or downstream,were not accessible due to the tall, dense vegetation. In addition, topography, land use and vegetation maps were evaluated to supplement the observations and data gathered during the site visit. These indirect methods were relied upon to make an assessment of the current extent and types of vegetation that exist along the Pilot Channel in the less accessible areas. The sources utilized included MMP documents, ESRI ArcGIS World Aerial imagery, and the URS biology staff familiar with the site to assist in the assessment. It was determined that the vegetation observed in the Pilot Channel was mostly families of Southern Willow Scrub and Mule Fat Scrub. Based on the observations of the amount of vegetation and the aerial imagery, it was assumed that channel sections with ponded water contain very little to no vegetation. It was also assumed that channel sections without visibly ponded water are heavily vegetated.

The sediment deposition amount for the analsysis was estimated based on the site visit visual observations, aerial imagery and a number of previous hydrologic and hydraulic studies discussed in the next section. The hydrologic and hydraulic studies for the Tijuana River Valley, as well as knowledge of the past maintenance conditions, indicate that large

EXISTING CONDITIONS

amounts of sediment are deposited in this region. Based on this information, it was assumed that the sediment deposition is an average of approximately 3 feet throughout the area of study for the channel. In addition, the aerial imagery shows that in some areas, the entire cross-section of the channel was vegetated as the channel banks are not visible and there is no visibly ponded water. This suggests that the sediment deposition in these sections of the channel is very high relative to the original Pilot Channel depth of 5 feet. As a result, it has been assumed that sediment deposition for that condition is 4.5 feet.

Subsequent to the hydraulics analysis, limited survey spot elevation data was obtained for several key locations along the channel. Based on the survey data, approximately 0.5 foot of sediment accumulated in the channel near Hollister Bridge and over 5 feet of sediment was deposited in the area of the SG Channel confluence.

SG Channel

The SG Channel is an existing historical agricultural channel with manufactured berms. The contributing sub-watershed area is approximately 6.7 square miles, primarily located south of the international border within Canon de los Mataderos. The SG Channel, as originally constructed, is an earthen channel approximately 20 feet wide and 15 feet deep. The SG Channel is tributary to the South Channel and flows in a northerly direction, from the international border past Monument Road until it confluences with the Pilot Channel. The portion of the SG Channel maintained by the City extends for a distance of approximately 3,040 feet.

During the site visit on September 13, 2012, it was observed that the low flow crossing at Monument Road consists of a 52-inch diameter Corrugated Metal Pipe (CMP), and it was measured to be approxmiately 110 feet long. The SG Channel was measured to be 40 feet wide and 12 feet deep immediately north of Monument Road (see Photo No. 15 through 18). Disney Crossing is located approximately 1,490 feet downstream of Monument Road. The SG Channel dimensions on the upstream side of Disney Crossing was measured to be 17.5 feet wide and 15 feet deep and on the downstream side was measured to be 23.5 feet wide and 15 feet deep (see Photo No. 19 through 23). The SG Channel streambed near the junction with the Pilot Channel was measured to be 18.5 feet wide and 4 feet deep (see Photo No. 29 through 31). See the Photo Log Key Map, figures 5 and 6, for a plan view of the field measurement locations along the SG Channel.

The sediment deposition observed immediately north of Monument Road was estimated to be approximately 2 feet deep and it was observed to be consistent at this depth throughout most of the length of the channel. The sediment deposition depth was estimated by measuring the difference in elevation between the flow line at the end of the 52-inch CMP concrete apron and the adjacent accumulated sediment (see Photo No. 16). At the Disney Crossing, the culverts (three 72-inch CMPs) had sediment deposition of over 1-foot in the culverts and the middle pipe was nearly covered with trash, debris, and

EXISTING CONDITIONS
vegetation at its entrance and exit (see Photo No. 24 through 28). Channel side slopes were observed to be mostly vegetated with disturbed Southern Willow Scrub and disturbed Ruderal Habitat, and near the downstream end it was vegetated with Mule Fat Scrub and disturbed Southern Willow Scrub. The vegetation density along the side slopes is very high in most areas and the streambed was unvegetated and consisted mainly of the sediment deposition material (see Photo No. 15 through 31). Note: See attached pictures
Hydrologic information (source of hydrologic information, summary of flow rates and return frequencies):
There are numerous sources of hydrologic information for the Tijuana River Valley, as it has been studied extensively throughout the years. The references used in this study as sources of hydrologic information include the following: • "Hydraulic Floodplain Study for the Tijuana River, U.S. and Mexico Border, San Diego County, California", prepared by URS Group Inc., dated April 10, 2012. (Reference 1); • "FEMA Region IX Hydrologic Analysis, San Diego County, California", prepared by BakerAECOM, dated October 1, 2010. (Reference 2); • "Conceptual Feasibility BMP Study for Tijuana River Valley", Technical Memorandum, Document ID No. CSD-TM-09-URS08-01, prepared by URS Corp., dated October 5, 2009. (Reference 3); • "Area V – Smugglers's Gulch Sta. 73+31.94 to Sta. 180+40.14 Packages 1a, 1, 1 (Drainage), 2 & 3", prepared by HNTB, dated September 15, 2008. (Reference 4); • "San Diego Infrastructure Border Field Park and Smuggler's Gulch, San Diego, California", prepared by Michael Baker Jr., Inc., dated December 2007. (Reference 5); • "Smuggler's Gulch Sedimentation and Erosion Study", prepared by Michael Baker Jr., Inc., dated April 2005. (Reference 6); and • "Hydrologic and Hydraulic Report for the Replacement of the Hollister Street Bailey Bridge of the Tijuana River", prepared by Berryman & Henigar Consultants, Inc., dated August 1996. (Reference 7). References 1 and 2 were used to establish the necessary peak storm flows, in cubic feet per second (cfs), used in the hydraulic analyses of the Pilot and Southern Channels. Reference 6 developed and included all of the necessary storm flows required for the

EXISTING CONDITIONS

hydraulic analysis of the SG Channel. Table 1 below summarizes the storm flows used in the hydraulic analysis of the channels.

Table 1. **Hydrologic Data Summary**

Channel	Watershed Area (mi^2)	Storm Event					
		2-Year (cfs)	5-Year (cfs)	10-Year (cfs)	25-Year (cfs)	50-Year (cfs)	100-Year (cfs)
Pilot	1,725	705	3,248	7,612	15,819	37,163	66,894
SG	5.52	653	1,479	1,668	2,520	3,081	3,626

Hydraulic analyses (description of hydraulic models created for project):

The United States Army Corps of Engineers Hydrologic Engineering Center's River Analysis System (HEC-RAS) software was used for the hydraulic analysis of both channels. The HEC-RAS hydraulic model performs one-dimensional steady and unsteady flow river hydraulics calculations and is the model used by FEMA to establish water surface elevation profiles and floodplain limits within the Tijuana River. The results of the hydrologic analyses included in Table 1 above were used in the hydraulic analyses.

The Pilot and SG Channel hydraulic models for this report were based on topography used in the Reference 1 study, which was generated based on the most current LiDAR data obtained from the United States Department of Homeland Security (USDHS, 2007). The cross sections used in the Pilot Channel hydraulic model were based on the cross-sections in Reference 1, but the cross sections were adjusted based on the field measurements and data collected during the site visit. The LiDAR data does not reflect all of the Pilot Channel details since in the generation of the data, ponded water and tall, dense vegetation block the channel dimensions from being detected. The cross sections developed for the SG Channel hydraulic model were also based on the Reference 1 topography in conjunction with the field measurements and data gathered during the site visit. To improve the hydraulic conveyance of the Pilot Channel, the existing adverse slope 700 feet west of the Hollister Bridge was assumed to be removed with the maintainence activities. The channel slopes were estimated based on the LiDAR data to be a positive grade of 0.04% for the Pilot Channel and 0.5% for SG Channel.

The Manning's Roughness Coefficient values used within the Pilot and SG Channel hydraulic models were based on field observations, vegetation data provided by the City of San Diego, and the ESRI ArcGIS World Aerial imagery. However, the Manning's Roughness Coefficients for the areas beyond the Pilot Channel banks were adopted from the hydraulic model developed in Reference 1. The Manning's Roughness Coefficients range from 0.03 to 0.10.

The steady flow boundary conditions of the hydraulic models were based on normal depth computations, as there were no starting water surface elevations available that could be directly used to initialize the hydraulic models. For that reason, the hydraulic

EXISTING CONDITIONS

models were extended 1,050 feet and 2,350 feet upstream and downstream, respectively, beyond the Pilot Channel length limits. The topography used is based on the horizontal North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD88).

Pilot Channel

For purposes of analyses and discussion in this study, the Southern Channel is defined as the Pilot Channel area including the areas contained within the northerly berms of the agricultural fields to the south of the Pilot Channel and roughly by the east-west section of Saturn Boulevard to the north of the Pilot Channel (see Figure 2 & 3 for the approximate limits). It is important to note that the storm flows listed in Table 1 may not flow entirely through the Pilot and/or the Southern Channel, as the storm flows normally spread across the Tijuana River Valley, particularly during larger storm events. In the hydraulic models prepared, all of the storm flow was "forced" to flow through the Pilot Channel only to evaluate the channel capacity as the only drainage facility under the various conditions to provide a baseline for comparison purposes.

To gain a basic understanding of how the stormwater flows split between the Northern and Southern Channels, a HEC-RAS flow distribution analysis was performed for the various storm events. HEC-RAS divides the cross sections in a predetermined number of slices and then calculates the flow conveyed by each slice. By manually determining which slices are part of each channel, an estimate of the flow for each channel was calculated. The purpose of this exercise was to establish a relationship between the Pilot Channel's capacity and the estimated flows that enter the Pilot/Southern Channel during a given storm event. Table 2 summarizes the flow distribution analysis for the 2-, 5-, and 10-year storm events.

Table 2. Flow Distribution Analysis Results Summary

Storm Event	Estimated Pilot/Southern ChannelFlow (cfs)
2-year	278
5-year	669
10-year	1,364

Current Vegetated Condition:

Pilot Channel

The HEC-RAS models developed for the current vegetated condition reflect the field conditions based on the site visit and the additional available data that is discussed in the existing conditions section. For the current condition, it was assumed that an approximate 1,500-foot section, from HEC-RAS cross section 108 to cross section 93, (see the

EXISTING CONDITIONS
Hydraulic Workmap for the HEC-RAS cross section locations) of the Pilot Channel contained up to 4.5 feet of sediment deposition, while the rest of the channel contained 3 feet of sediment deposition. A Manning's Roughness Coefficient of 0.03 was assigned to the sections of the Pilot Channel that contained ponded water. The sections of the Pilot Channel that were determined to have a high vegetation density were assigned a Manning´s Roughness Coefficient of 0.08. For consistency, the Manning´s Roughness Coefficients for the areas beyond the Pilot Channel were adopted from the Reference 1 (URS Group Inc., April 10, 2012) hydraulic model, which varies from 0.05 to 0.08. SG Channel Because the SG Channel was readily accessible and visible, the selection of the Manning's Roughness Coefficient for the SG Channel was based on the field observations. A Manning's Roughness Coefficient of 0.03 was assigned to the SG Channel streambed as it was fully covered in sediment deposition. A Manning's Roughness Coefficient of 0.08 was assigned to the heavily vegetated side slopes. The sediment deposition was assumed to be 2 feet throughout the length of the channel. Note: See attached model output & workmap
Ultimate Vegetated Condition:
The Pilot and SG Channel hydraulic models developed for the "Ultimate Vegetated Condition" are similar to the "Current Vegetated Condition", except that the Manning´s Roughness Coefficients were increased to 0.10 and 0.08 within the Pilot and SG Channels, respectively, to reflect a maximum vegetation carrying capacity. The geometry and sediment deposition levels were maintained from the Current Vegetated Condition. Note: See attached model output & workmap
Maintained Condition – No sediment removed:
Pilot Channel The Pilot Channel hydraulic models were adjusted assuming that the vegetation that currently exists in the channel bed is trimmed down to the base, just above the sediment deposition levels. A Manning´s Roughness Coefficient of 0.04 was assigned to the Pilot Channel streambed sections that are currently vegetated. The sections that have ponded water were unchanged with a Manning´s Roughness Coefficient of 0.03. SG Channel The SG Channel hydraulic model remained unchanged from the Current Vegetated Condition. A Manning´s Roughness Coefficient of 0.03 was assigned for the streambed and 0.08 for the sides slopes. Note: See attached model output & workmap

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Maintained Condition – Sediment removed (if applicable):

This condition used the Maintained Condition – No Sediment Removed models as the base for both channels. The sediment deposition along the channel bed was removed to restore both channels to their original design conditions. The Manning´s Roughness Coefficients along the channel beds were set to 0.025. Also for the SG Channel, the set of triple 72-inch CMPs at Disney Crossing were assumed to be completely cleared of vegetation, trash and debris at the entrances and exits.

Note: See attached model output & workmap

MAINTENANCE IMPACTS

Hydraulics Results (Describe capacity of channel for each condition):

Current Vegetated Condition:

Pilot Channel

In the Current Vegetated Condition, the Pilot Channel's capacity was calculated at less than 10 cfs with zero freeboard due to the high levels of sediment deposition. The results show that the Pilot Channel alone is not capable of conveying storm water flows of a 2-year storm event. Table 3 below summarizes the Pilot Channel hydraulic analyses results under the Current Vegetated Condition.

Table 3. Pilot Channel Results Summary

Storm Event	Storm Event Flow Rate (cfs)	Calculated Design Capacity (cfs)[1]	Current Condition Capacity (cfs)
2-year	278	200	10

[1]Based upon MMP channel dimensions.

SG Channel

The results of the Current Vegetated Condition model for the SG Channel showed that the channel only has capacity to convey the 2-year storm event flows, while maintaining 1 foot of freeboard in the channel. Without considering freeboard, the SG Channel has a maximum capacity of approximately 800 cfs before the stormwater flows will overtop the manufactured berm on the east side at HEC-RAS cross section number 2623.27 (approximately 90 feet upstream of the Disney Crossing). The results also showed that at the 2-year storm event flow level, Monument Road will be overtopped by the storm flows. As the storm water that weir flows over Monument Road expands due to the roadway profile, it is partially redirected towards the southerly end of the manufactured berm on the west side; thus creating a risk potential for that berm to be undermined.

MAINTENANCE IMPACTS

Table 4 below summarizes the SG Channel hydraulic analyses results under the Current Vegetated Condition.

Table 4. SG Channel Results Summary

Storm Event	Storm Event Flow Rate (cfs)	Calculated Design Capacity (cfs)[1]	Current Condition Capacity (cfs)
2-year	653	900	653
5-year	1,479	900	800

[1] Based upon MMP channel dimensions

Note: See attached HEC-RAS model profile

Ultimate Vegetated Condition:

Pilot Channel

As in the previous condition, the Pilot Channel's capacity was calculated at less than 10 cfs. The Pilot Channel alone provides very little conveyance capacity in this condition. Table 5 below summarizes the Pilot Channel hydraulic analyses results under the Ultimate Vegetated Condition.

Table 5. Pilot Channel Results Summary

Storm Event	Storm Event Flow Rate (cfs)	Calculated Design Capacity (cfs) [1]	Ultimate Vegetated Condition Capacity (cfs)
2-year	278	200	<10

[1] Based upon MMP channel dimensions

SG Channel

The results of the Ultimate Vegetated Condition model for the SG Channel shows that the channel's capacity is just under the 2-year storm event at 600 cfs and no freeboard. The results show that a flow of 600 cfs would overtop the channel at HEC-RAS cross section number 2623.27. Table 6 below summarizes the SG Channel hydraulic analyses results under the Ultimate Vegetated Condition.

Table 6. SG Channel Results Summary

Storm Event	Storm Event Flow Rate (cfs)	Calculated Design Capacity (cfs) [1]	Ultimate Vegetated Condition Capacity (cfs)
2-year	653	900	600
5-year	1,479	900	600

[1] Based upon MMP channel dimensions

Note: See attached HEC-RAS model profile

MAINTENANCE IMPACTS

Maintained Condition – No Sediment removed:

Pilot Channel

The Pilot Channel's capacity was insignificantly improved with the removal of the vegetation to approximately 10 cfs. Table 7 below summarizes the Pilot Channel hydraulic analyis results summary under the Maintained Condition – No Sediment removed.

Table 7. Pilot Channel Results Summary

Storm Event	Storm Event Flow Rate (cfs)	Calculated Design Capacity (cfs) [1]	No Sediment Removed Capacity (cfs)
2-year	278	200	10

[1] Based upon MMP channel dimensions

SG Channel

The results for the Maintained Condition – No Sediment removed of the SG Channel are the same as the Current Vegetated Condition because the channel bed is currently unvegetated. See Table 4 for the hydraulic analysis results summary.

Note: See attached HEC-RAS model profile

Maintained Condition – Sediment removed:

Pilot Channel

The removal of the sediment in the Pilot Channel increases capacity to approximately 200 cfs. See Table 8 for the Pilot Channel results summary under the Maintained Condition – Sediment removed.

Table 8. Pilot Channel Results Summary

Storm Event	Storm Event Flow (cfs)	Calculated Design Capacity (cfs) [1]	Sediment Removed Capacity (cfs)
2-year	278	200	200

[1] Based upon MMP channel dimensions

SG Channel

The results for the Maintained Condition – Sediment removed for the SG Channel show that the maximum capacity is approximately 900 cfs, which is 250 cfs above the 2-year storm event flow rate. The conveyance capacity of the channel is limited by the elevation discontinuities (HEC-RAS cross section 3863.17 and 2623.27) of the manufactured berm

MAINTENANCE IMPACTS

profiles.

One assumption of the analysis is that all of the storm flow that crosses Monument Road stays in the channel. The calculated water surface elevation of the maximum capacity flow at Monument Road is higher than the highest elevations of the channel/roadway profile in the area. This indicates that some of the runoff may find other paths around the SG Channel to the Tijuana River and could result in a decrease in flow downstream of Monument Road. See Table 9 for the SG Channel hydraulic analysis results summary under the Maintained Condition – Sediment removed.

Table 9. SG Channel Results Summary

Storm Event	Storm Event Flow (cfs)	Calculated Design Capacity (cfs) [1]	Sediment Removed Capacity (cfs)
2-year	653	900	900
5-year	1,479	900	900

[1] Based upon MMP channel dimensions

Note: See attached HEC-RAS model profile

Areas within channel that can be avoided (this section can be completed upon completion of Individual Biological Assessment Form):

Subsequent to the hydraulic analysis, limited suvey data was obtained to help understand the sediment deposition in a few key areas. Based on this limited survey spot elevation data, the sediment deposition east of Hollister Bridge is approximately 0.5 feet. Comparing the small amount of sediment deposition to the biological impacts necessary to maintain this area, it was determined that the 100-foot channel section east of Hollister Bridge will not require maintainence at this time.

Would the velocity of storm water during a "bank-full" storm event exceed the velocities identified for unlined channels per Table 1-104.108 of the City's Design Manual? If so, describe the appropriate form of erosion control (e.g., check dam or comparable mechanism). ~~Is a downstream check dam or comparably mechanism required?~~

The velocities within the Pilot and SG Channel during a bank-full event approximately meet the maximum velocities identified in Table 1-104.10A of the City's Design Manual. However, the current conditions and maintenance history show that the streambeds of both channels experience aggradation as opposed to degradation. Additional erosion control measures, such as check dams, are not necessary for these channels since channel erosion does not appear to be an issue at these locations and MMP Protocols WQ-9 and WQ-10 would not be applicable.

MITIGATION
Conclusion/Recommendations (Describe the limits of recommended maintenance, degree to which native vegetation within the facility can be retained, and capacity of maintained channel):
Pilot Channel The results of the various scenarios and conditions analyzed indicate that the Pilot Channel alone conveys approximately 70-percent of the 2-year storm flow under the Maintained Condition – Sediment removed. It is recommended that the Maintained Condition – Sediment removed option be implemented to increase the channel's conveyance capacity from 10 cfs to 200 cfs. This study is largely based on available data and information from previous studies and information databases. To further understand the complexities of this channel, a detailed study with ground cross-sectional survey data and updated topography would be needed, as well as a detailed Northern and Southern Channel split flow analysis. Another important factor to be further investigated is the amount and types of sediment and debris that are deposited in this channel as these play a large role in the bulking of the storm water runoff. The long history of flooding in this area and the past maintenance record indicate a need for continued full vegetation and sediment removal in the channel. SG Channel The results show that the SG Channel current condition capacity is approximately the 2-year storm flow. Flows larger than the 2-year storm flow puts the west berm, immediately to the north of Monument Road, at risk for erosion. Under the Maintained Condition – Sediment removed option, the maximum capacity of the SG Channel is increased to 900 cfs. The past maintenance record and flooding history indicate a need for continued full vegetation and sediment removal in the channel until other future measures upstream of the channel decrease the need for this maintenance. Therefore, it is recommended that the accumulated sediment deposition in the SG Channel be removed. When clearing the channel, it is recommended that the vegetation on the side slopes be protected in place where possible, as the vegetation protects the side slopes from erosion. A further recommendation is for the concrete grout near the outlet of the 52-inch CMP be reconstructed, as this area may experience high velocities, and would help prevent failures around the outlet of the culvert. Additionally, the maximum flow that the SG Channel can convey may be increased to 1,000 cfs if the discontinuities in the berm profiles at HEC-RAS cross sections 2623.27 and 3863.17 are reconstructed to match the adjacent elevations.

ADDITIONAL COMMENTS OR RECOMMENDATIONS

The Recirculated Program Environmental Impact Report (PEIR) for the Master Storm Water System Maintenance Program lists four alternatives that would reduce the need for regular maintenance of the storm water facilities. The list of those alternatives is summarized below followed by a brief discussion as to how they apply to the Pilot and SG Channels.

- Raising the channel banks by constructing walls or berms along the top of the channels – the hydraulic analyses show that increasing the capacity of the Pilot Channel with construction of walls or berms would be beneficial to increase the channel's capacity. However since the Pilot Channel works in conjunction with the Southern Channel to provide flood protection to the surrounding properties, this alternative is not recommended as the walls would disrupt the synergy between the channels. Based on the visual inspection of the manufactured berms along the SG Channel, and the available topography for the area, it was determined that there are a number of discontinuities and depressions along the profiles of the berms. It is recommended that the berms be reconstructed along the depressions to maintain a continuous profile.
- Diverting storm water in pipes around constrained segments – the watershed size and channel flow rates make this alternative impractical. An underground storm drain system would be very large to convey the flows of the Pilot and SG Channels. The permitting, environmental, and monetary costs associated with such a system would render it prohibitive.
- Widening channels to accommodate vegetation – these channels were constructed in larger drainages to reduce flooding impacts of the smaller storm events on properties in the Tijuana River Valley. The construction of larger channels to maintain the vegetation would be at odds with limiting the disturbance of the existing vegetation in the area. The studies of this area also indicate that without a plan to reduce the continuous and unpredictable sediment loads carried by the Tijuana River, widening would only provide a temporary solution and would have significant biological and potentially cultural resource impacts.
- Off-site runoff reduction – 73-percent of the watershed tributary to the Tijuana River is in Mexico. Efforts are under way by the Tijuana River Valley Recovery Team to coordinate with the Mexican authorities to create a program that reduces the amount of runoff, sediment, trash and pollutants carried by the Tijuana River. Additionally, the costs of reducing impermeable areas, redirecting runoff into previous areas, etc. only within the 27 percent of the watershed area that is within the U.S. would be very high, rendering this type of project cost prohibitive.

Further analysis is recommended at Monument Road to investigate the requirements to mitigate or reduce flooding at this crossing and to establish a benefit-cost ratio criteria.

ADDITIONAL COMMENTS OR RECOMMENDATIONS
Based on the topographic information, flows larger than the 2-year storm flows have a tendency to flood the properties adjacent to either side of the channel. The benefit-cost ratio criteria should also consider that the 5-year storm flows would overtop the SG Channel at Disney Crossing.

Attachment 2
Site Photos taken by URS on September 13, 2012

SITE PHOTOS

These photographs were taken during a site visit that was conducted on September 13th, 2012. See the Hydraulic Workmap for the photograph numbers, locations, and orientation. Photograph numbers 1 through 14 pertain to the Tijuana River Pilot Channel (Pilot), while Photograph numbers 15 through 31 pertain to the Smuggler's Gulch (SG) Channel.

1. Pilot Channel – Looking upstream from the Hollister Bridge.

2. Pilot Channel – Immediately upstream of the Hollister Bridge. No vegetation, trash or debris is observed within the Pilot channel.

3. Pilot Channel – Looking downstream from the Hollister Bridge.

4. Pilot Channel – Immediately downstream of the Hollister Bridge. No vegetation, trash or debris is observed within the Pilot channel.

5. Pilot Channel – Immediately downstream of the Hollister Bridge. No vegetation, trash or debris is observed within the Pilot channel.

6. Pilot Channel – Immediately downstream of the Hollister Bridge. No vegetation, trash or debris is observed within the Pilot channel.

7. Pilot Channel – Looking northeast at the Pilot\SG channel confluence point.

8. Pilot Channel – Looking north at the Pilot\SG channel confluence point.

9. Pilot Channel – Looking west at the Pilot\SG channel confluence point.

10. Pilot Channel – Looking southwest at the Pilot\SG channel confluence point.

11. Pilot Channel – Looking south at the Pilot\SG channel confluence point.

12. Pilot Channel – Looking southeast at the Pilot\SG channel confluence point.

13. Pilot Channel – Looking east at the Pilot\SG channel confluence point.

14. Pilot Channel – Looking south towards the Pilot\SG channel confluence point.

15. SG Channel – Looking north near the outlet of the 52-inch CMP culvert under Monument Road.

16. SG Channel – Looking north near the outlet of the 52-inch CMP culvert under Monument Road.

17. SG Channel – Looking north from a location just downstream of the 52-inch CMP outlet.

18. SG Channel – Looking north from a point approximately 150 feet downstream of the 52-inch CMP outlet. The vegetation density is very high on the west side slope, while on the east side slope is very light.

19. SG Channel – Looking south (upstream) from atop the Disney Crossing. The vegetation is very thick on the side slopes, while the streambed is mainly unvegetated.

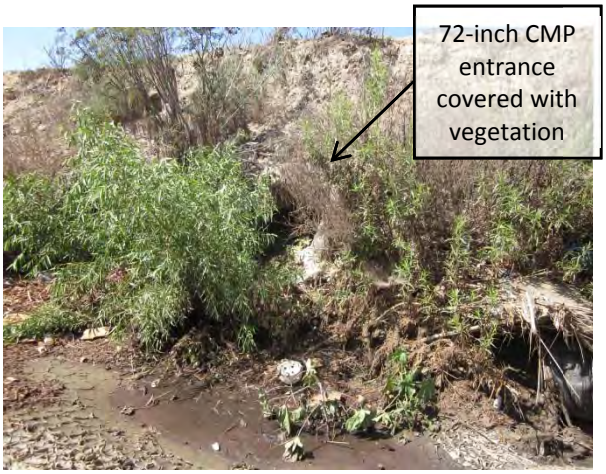
20. SG Channel – Looking south (upstream) from a point located approximately 40 feet upstream of the Disney Crossing entrance. The vegetation is very thick on the side slopes, while the streambed is mainly unvegetated.

21. SG Channel – Looking north (downstream) from atop the Disney Crossing.

22. SG Channel – Looking north (downstream) from atop the Disney Crossing.

23. SG Channel – Looking north (upstream) from a point approximately 50 feet downstream from the Disney Crossing. The high amount of sediment deposition is visible on the streambed.

24. SG Channel – Triple 72-inch CMPs entrance (upstream) at Disney Crossing. The middle pipe entrance is almost completely covered with vegetation, sediment deposition, trash and debris. The high levels of sediment deposition is visible immediately upstream of the entrance.



25. SG Channel – Middle 72-inch CMP at Disney Crossing. Vegetation and sediment deposition are visible at the entrance of the pipe.

26. SG Channel – Westerly 72-inch CMP at Disney Crossing. Vegetation, sediment deposition, trash and debris are visible at the entrance.

27. SG Channel – Easterly 72-inch CMP at Disney Crossing. Vegetation, sediment deposition, trash and debris are visible at the entrance.

28. SG Channel – Easterly 72-inch CMP outlet (downsteam) at Disney Crossing. Vegetation and sediment deposition block the outlet of the middle 72-inch CMP.

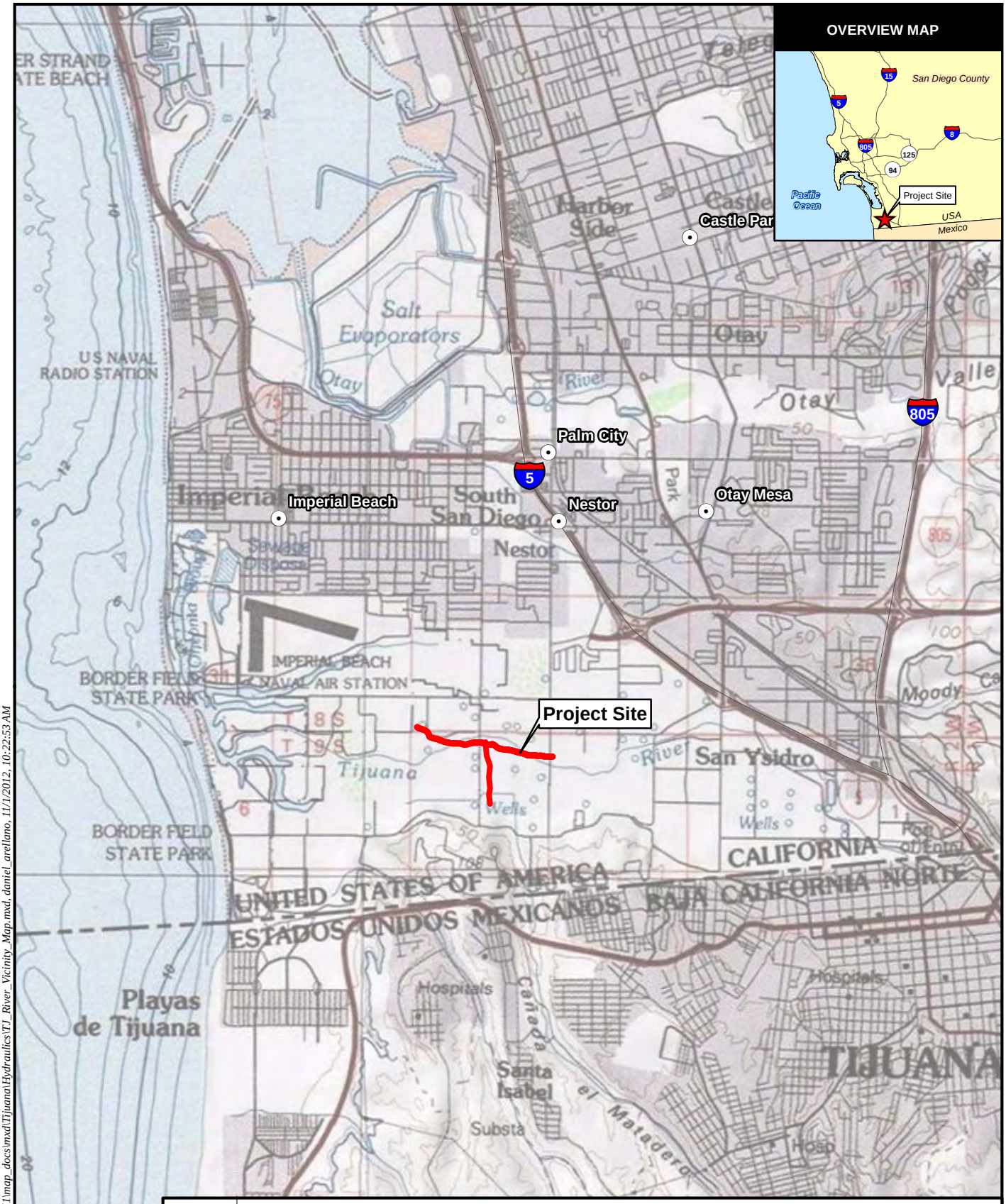
29. SG Channel – Looking south (upstream) at a point approximately ±450 feet upstream of the Pilot\SG channel confluence. The high amount of sediment deposition is visible on the streambed.

30. SG Channel – Looking north (downstream) at a point approximately ±450 feet upstream of the Pilot\SG channel confluence. The high amount of sediment deposition is visible on the streambed.

31. SG Channel - Most downstream section of the SG channel immediately upstream of the Pilot\SG channel confluence. The high amount of sediment deposition is visible on the streambed.

Attachment 3
Exhibits for the URS IHHA Report

FIGURE 1. VICINTIY MAP



SOURCES: USA Topo Map (National Geographic Society, 2011); Counties, Roads, Cities (Esri, 2010); Project Boundary (URS, 2012).

VICINITY MAP
TIJUANA RIVER PILOT CHANNEL
SAN DIEGO COUNTY, CA

URS

0.5 0 0.5 1 Miles

SCALE: 1" = 1 miles (1:63,360)
SCALE CORRECT WHEN PRINTED AT 8.5X11

CREATED BY: DA	DATE: 11/1/2012	FIG. NO: 1
PM: BE	PROJ. NO: 27679954.04000	

Path: G:\gis\projects\1577\27679051\map_docs\mxd\Tijuana\Hydraulics\TJ_River_Vicinity_Map.mxd, daniel_arellano, 11/1/2012, 10:22:53 AM

FIGURE 2. TIJUANA RIVER PILOT CHANNEL HYDRAULIC WORKMAP

LEGEND

- 97.5 — Cross Section Number & Location
- Pilot Channel
- Southern Channel Limits*
- 3 — Photo Location & Orientation
- Direction of Channel Flow

*Approximate Southern Channel Limits as defined for purposes of this project only. The Southern Channel actual limits extend beyond those shown in this exhibit.

Saturn Blvd

Saturn Blvd

SOUTHERN

CHANNEL

77.5

85

90

93

97.5

108

119

120

122

MATCHLINE - SEE FIG. NO. 3

127.5

SOURCES: Aerial Imagery, Streets (Esri, 2010); Cross Sections, Pilot Channel, Southern Channel Limits (URS, 2012).

TIJUANA RIVER PILOT CHANNEL HYDRAULIC WORKMAP SAN DIEGO, CA

URS

200 0 200 400 Feet

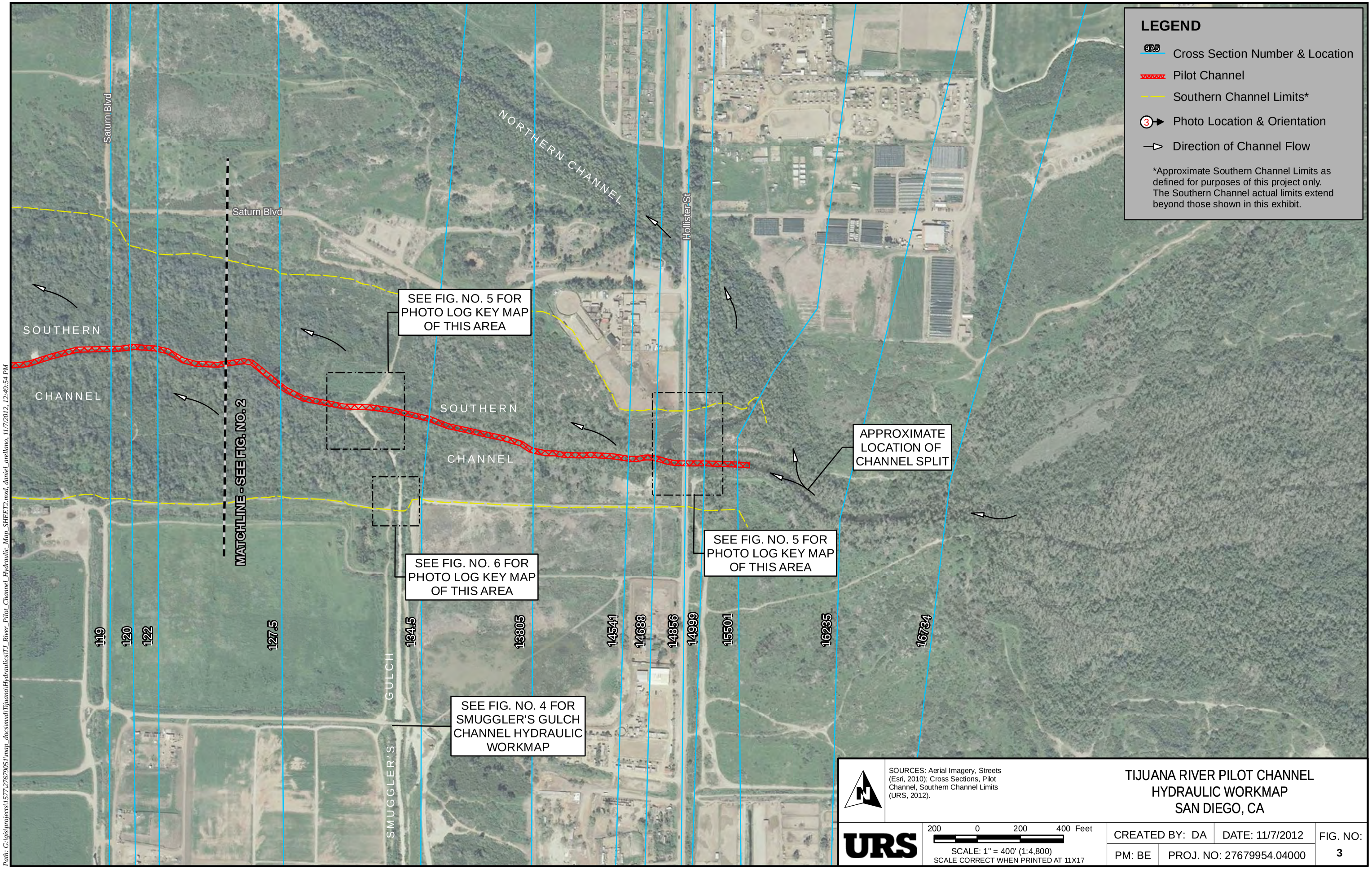
SCALE: 1" = 400' (1:4,800)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DA	DATE: 11/7/2012	FIG. NO:
PM: BE	PROJ. NO: 27679954.04000	2

Path: G:\gis\projects\1577\27679051\map_docs\mxd\TijuanaHydraulics\TJ_River_Pilot_Channel_Hydraulic_Map.mxd, daniel_arellano, 11/7/2012, 10:43:47 AM

FIGURE 3. TIJUAN RIVER PILOT CHANNEL HYDRAULIC WORKMAP



Path: G:\gis\projects\15577\27679051\map_docs\mxd\TijuanaHydraulics\TJ_River_Pilot_Channel_Hydraulic_Map_SHEET2.mxd, daniel_arellano, 11/7/2012, 12:49:54 PM

SOURCES: Aerial Imagery, Streets (Esri, 2010); Cross Sections, Pilot Channel, Southern Channel Limits (URS, 2012).

TIJUANA RIVER PILOT CHANNEL HYDRAULIC WORKMAP SAN DIEGO, CA

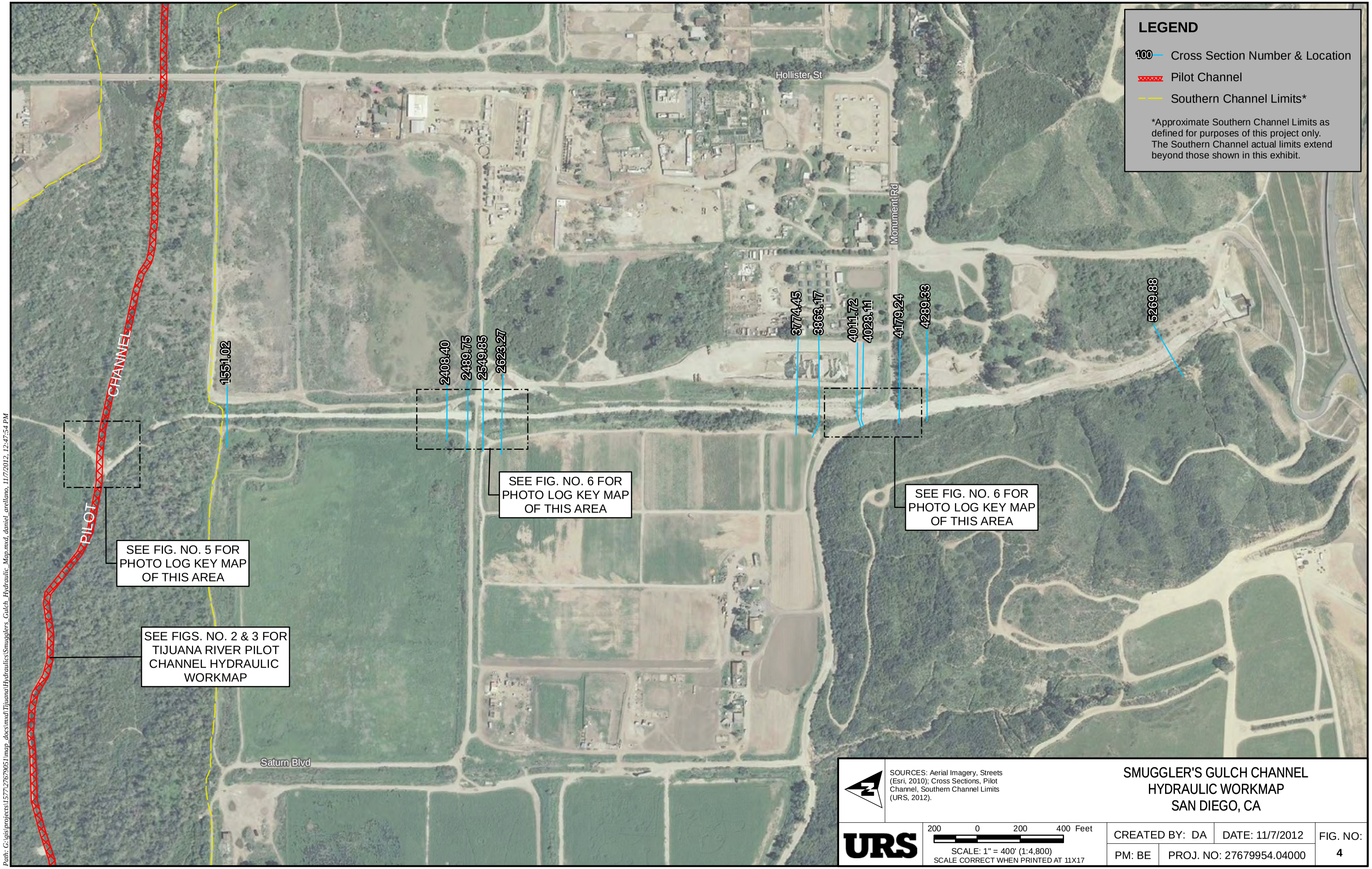
URS

200 0 200 400 Feet

SCALE: 1" = 400' (1:4,800)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DA	DATE: 11/7/2012	FIG. NO: 3
PM: BE	PROJ. NO: 27679954.04000	

FIGURE 4. SMUGGLER'S GULCH CHANNEL HYDRAULIC WORKMAP



Path: G:\gis\projects\1577\27679051\map_docs\mxd\Tijuana\Hydraulics\Smugglers_Gulch_Hydraulic_Map.mxd, daniel_arellano, 11/7/2012, 12:47:54 PM

SOURCES: Aerial Imagery, Streets (Esri, 2010); Cross Sections, Pilot Channel, Southern Channel Limits (URS, 2012).

SMUGGLER'S GULCH CHANNEL HYDRAULIC WORKMAP SAN DIEGO, CA

URS

200 0 200 400 Feet

SCALE: 1" = 400' (1:4,800)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DA	DATE: 11/7/2012	FIG. NO: 4
PM: BE	PROJ. NO: 27679954.04000	

FIGURE 5. TIJUANA RIVER PILOT CHANNEL PHOTO LOG KEY MAP

SOURCES: Aerial Imagery, Streets (Esri, 2010); Channels, Photo Locations (URS, 2012).

TIJUANA RIVER PILOT CHANNEL
PHOTO LOG KEY MAP
SAN DIEGO, CA

URS

25 0 25 50 Feet

SCALE: 1" = 50' (1:600)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DA	DATE: 11/7/2012	FIG. NO: 5
PM: BE	PROJ. NO: 27679954.04000	

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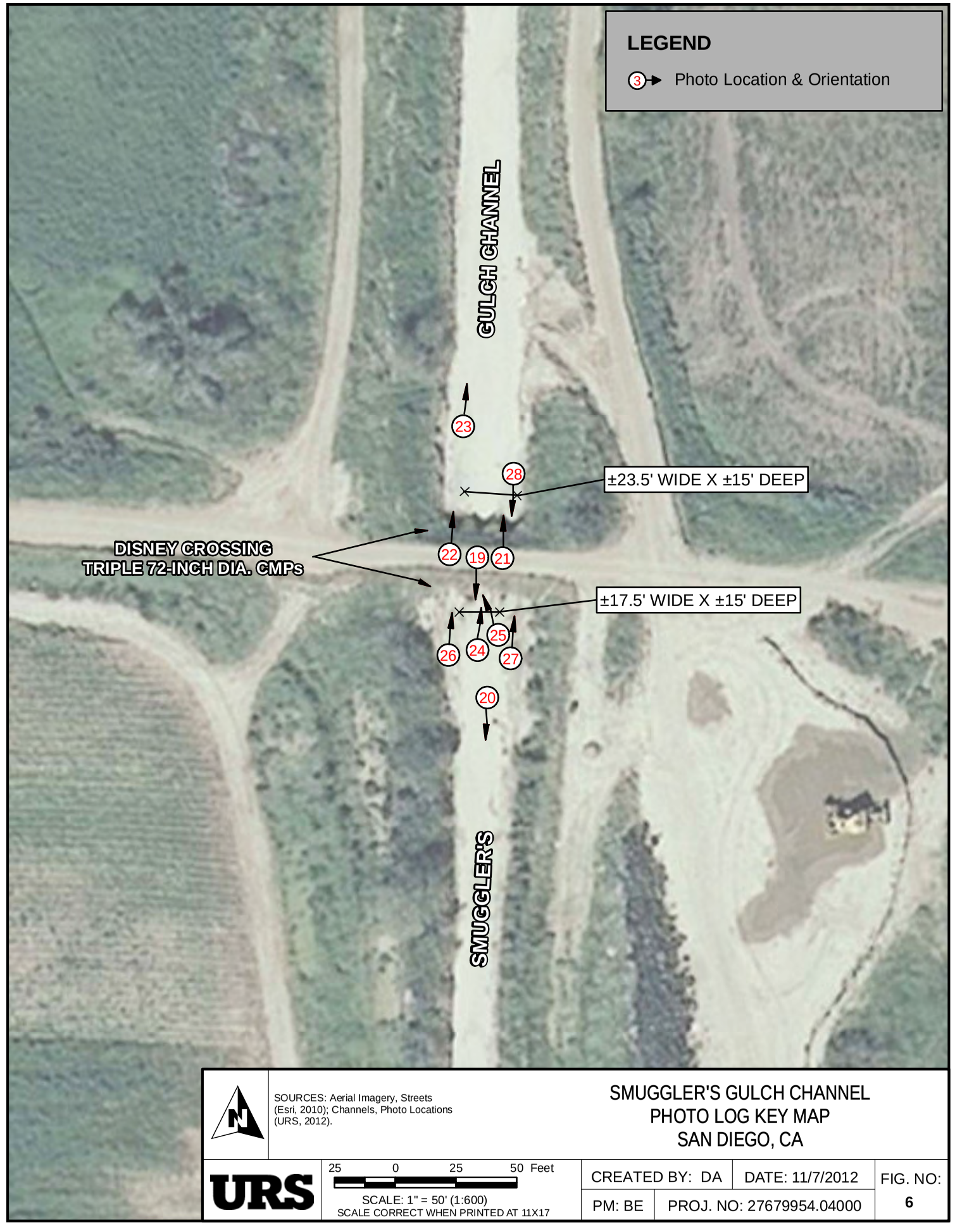
FIGURE 6. SMUGGLER'S GULCH CHANNEL PHOTO LOG KEY MAP



SOURCES: Aerial Imagery, Streets (Esri, 2010); Channels, Photo Locations (URS, 2012).

SMUGGLER'S GULCH CHANNEL
PHOTO LOG KEY MAP
SAN DIEGO, CA

URS

25 0 25 50 Feet

SCALE: 1" = 50' (1:600)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DA	DATE: 11/7/2012	FIG. NO: 6
PM: BE	PROJ. NO: 27679954.04000	

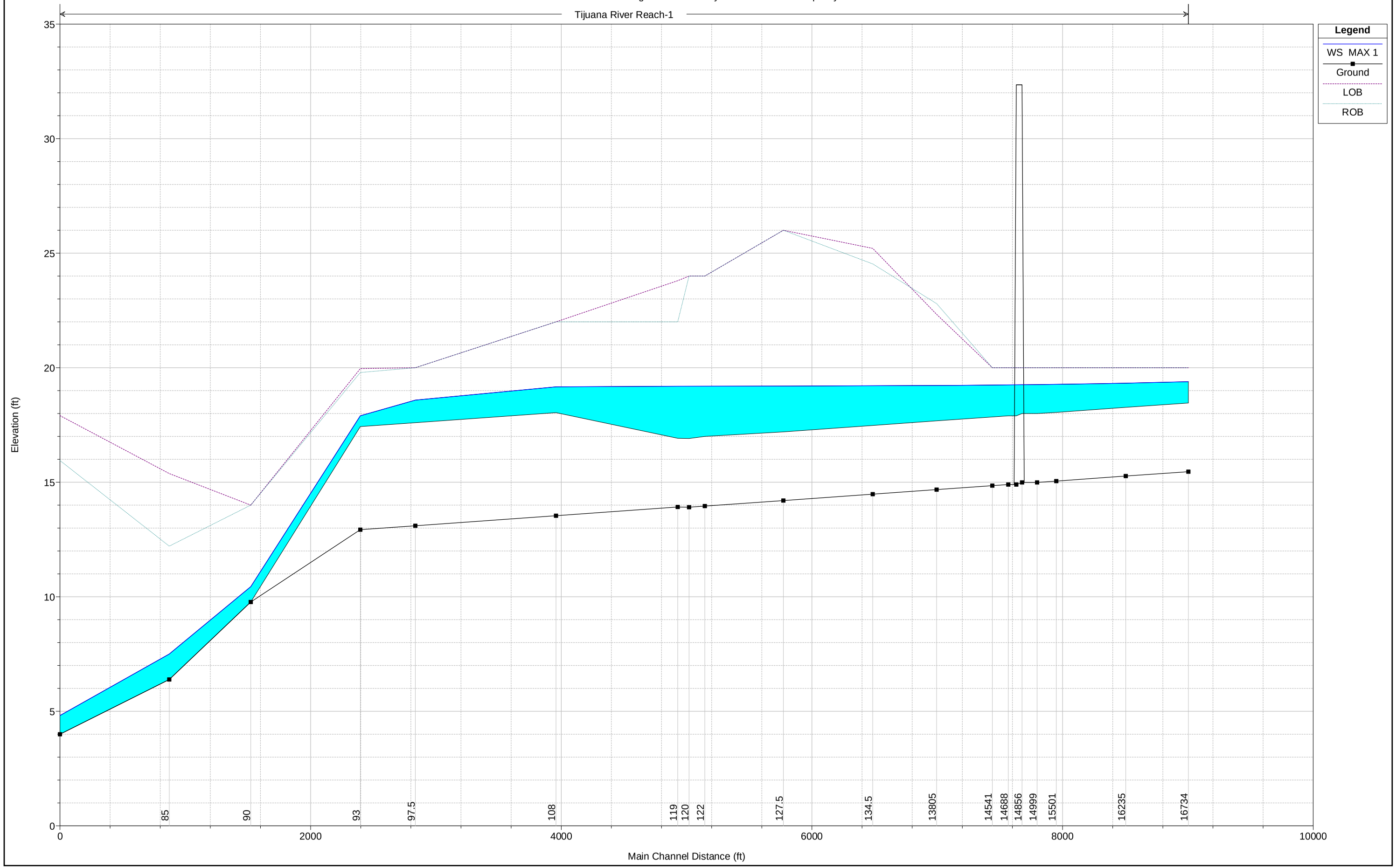
Path: G:\gis\projects\1577\27679051\map_docs\mxd\Tijuana\Hydraulics\Smugglers_Gulch_Photo_Log_Split.mxd, daniel_arellano, 11/7/2012, 1:50:26 PM

Attachment 4
Hydraulic backup data for the URS IHHA Report

HYDRAULIC PROFILES FOR CURRENT VEGETATED CONDITION MODEL

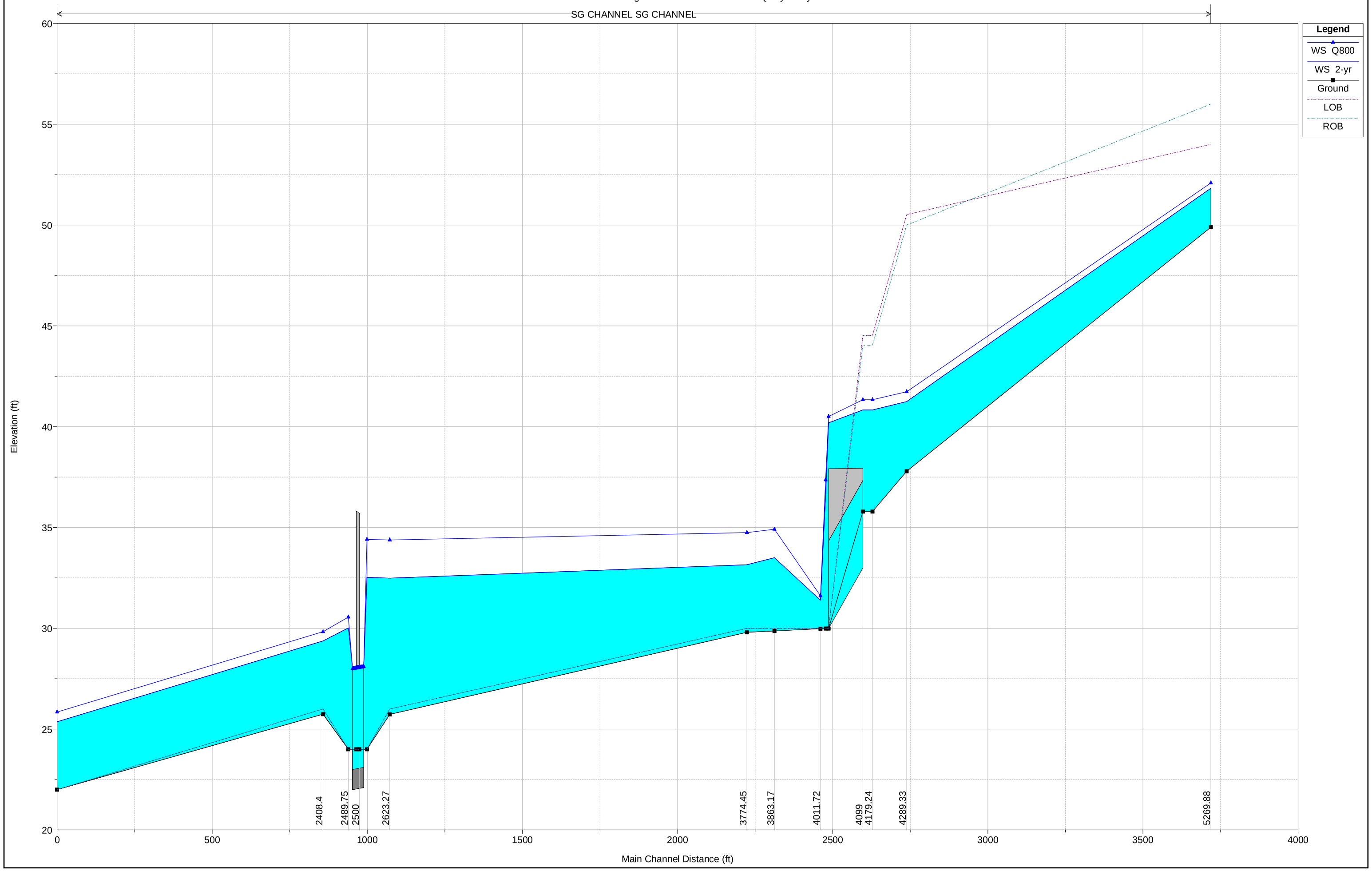
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012

Geom: Current Veg Cndtn-Pilot Only Flow: Pilot Max Capacity



Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012

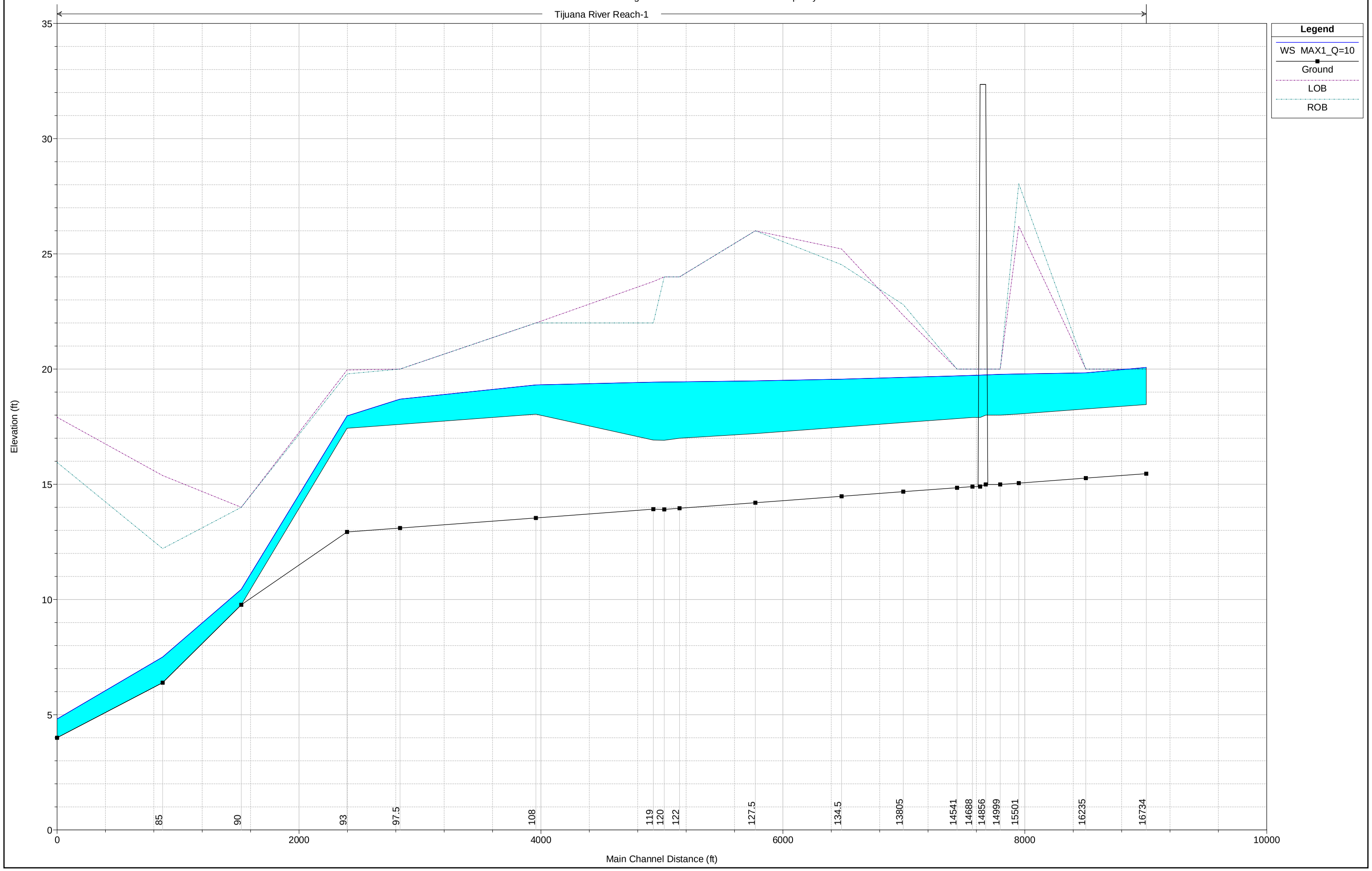
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr



HYDRAULIC PROFILES FOR ULTIMATE VEGETATED CONDITION MODEL

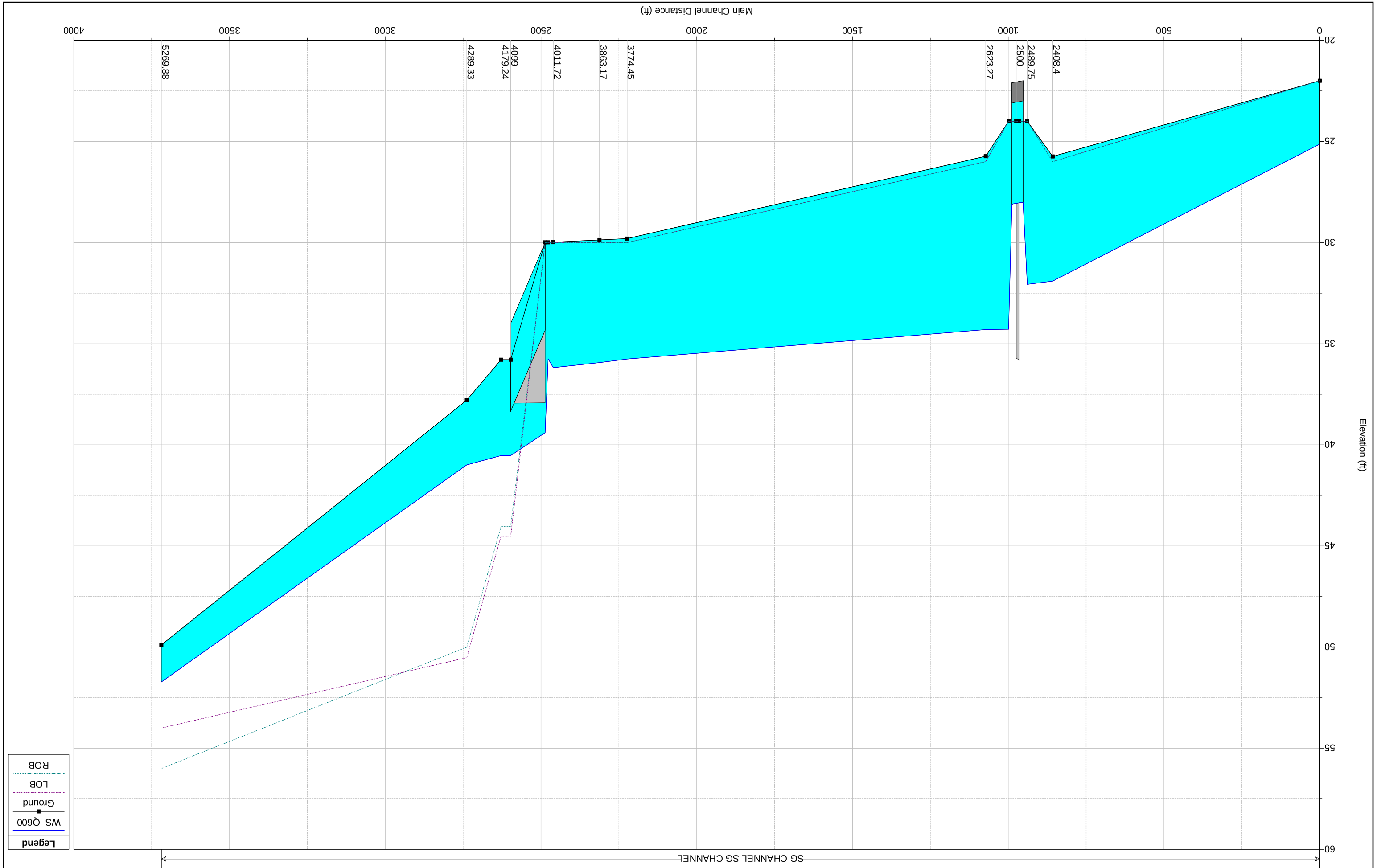
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012

Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity



Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

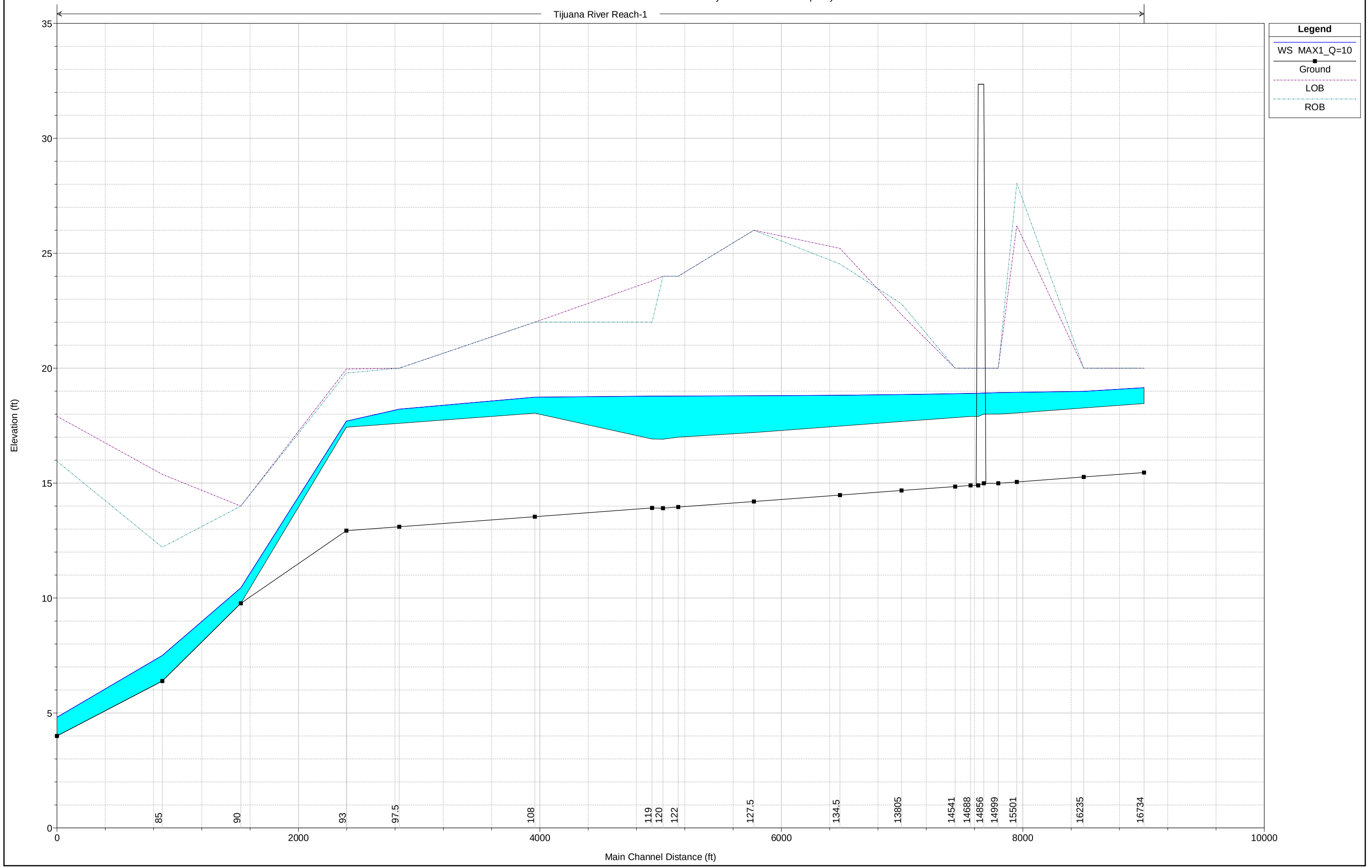
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr



HYDRAULIC PROFILES FOR MAINTAINED CONDITION MODEL
(NO SEDIMENT REMOVED)

Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012

Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity

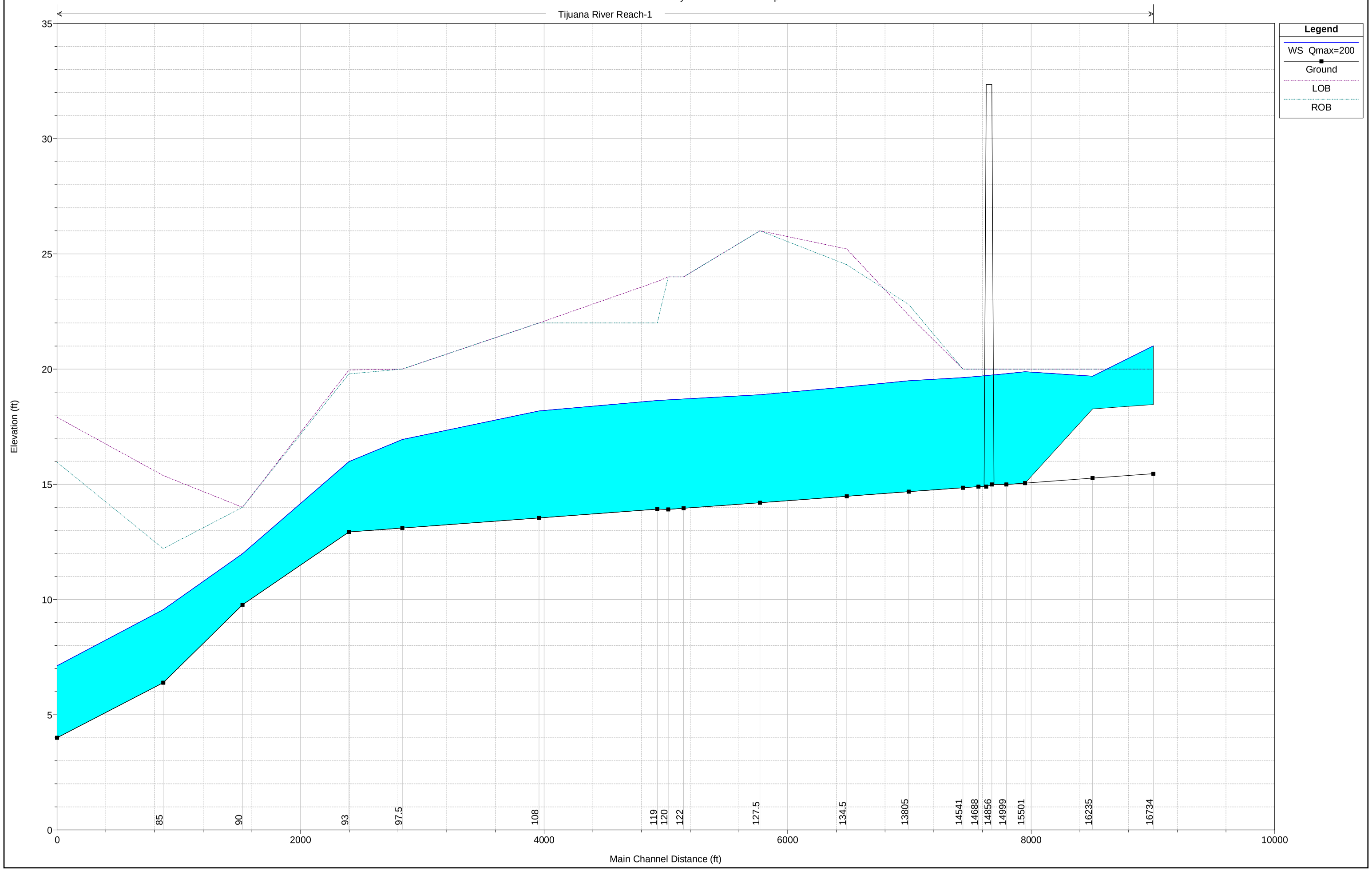


For Smuggler's Gulch Channel "Maintained Condition – No Sediment Removed" Hydraulic Profile, see the "Current Vegetated Condition" Hydraulic Profile.

HYDRAULIC PROFILES FOR MAINTAINED CONDITION MODEL (SEDIMENT REMOVED)

Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012

Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match



Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

SG CHANNEL SG CHANNEL

Legend

WS Q900

Ground

LOB

ROB

Elevation (ft)

60
55
50
45
40
35
30
25
20

0
500
1000
1500
2000
2500
3000
3500
4000

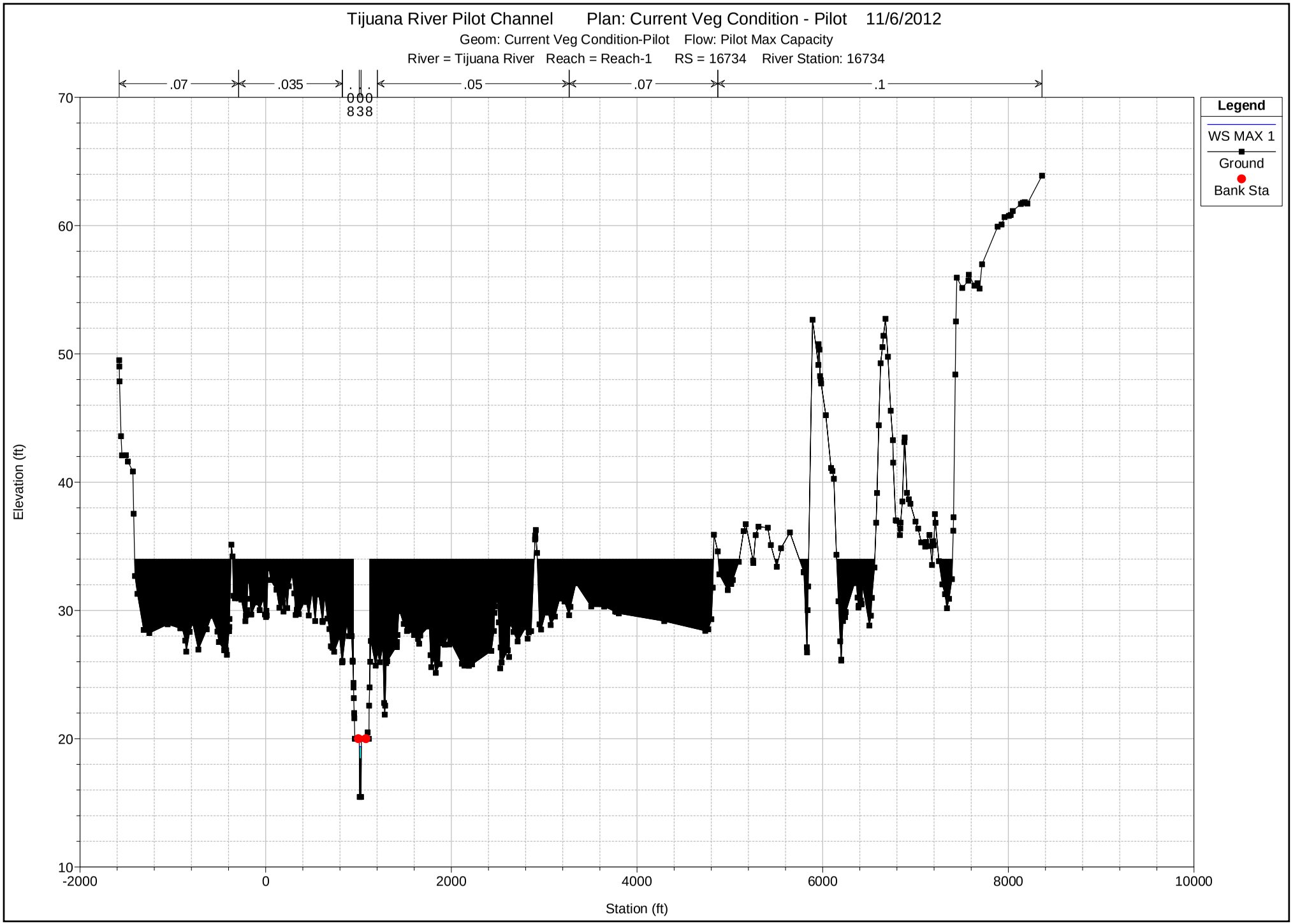
Main Channel Distance (ft)

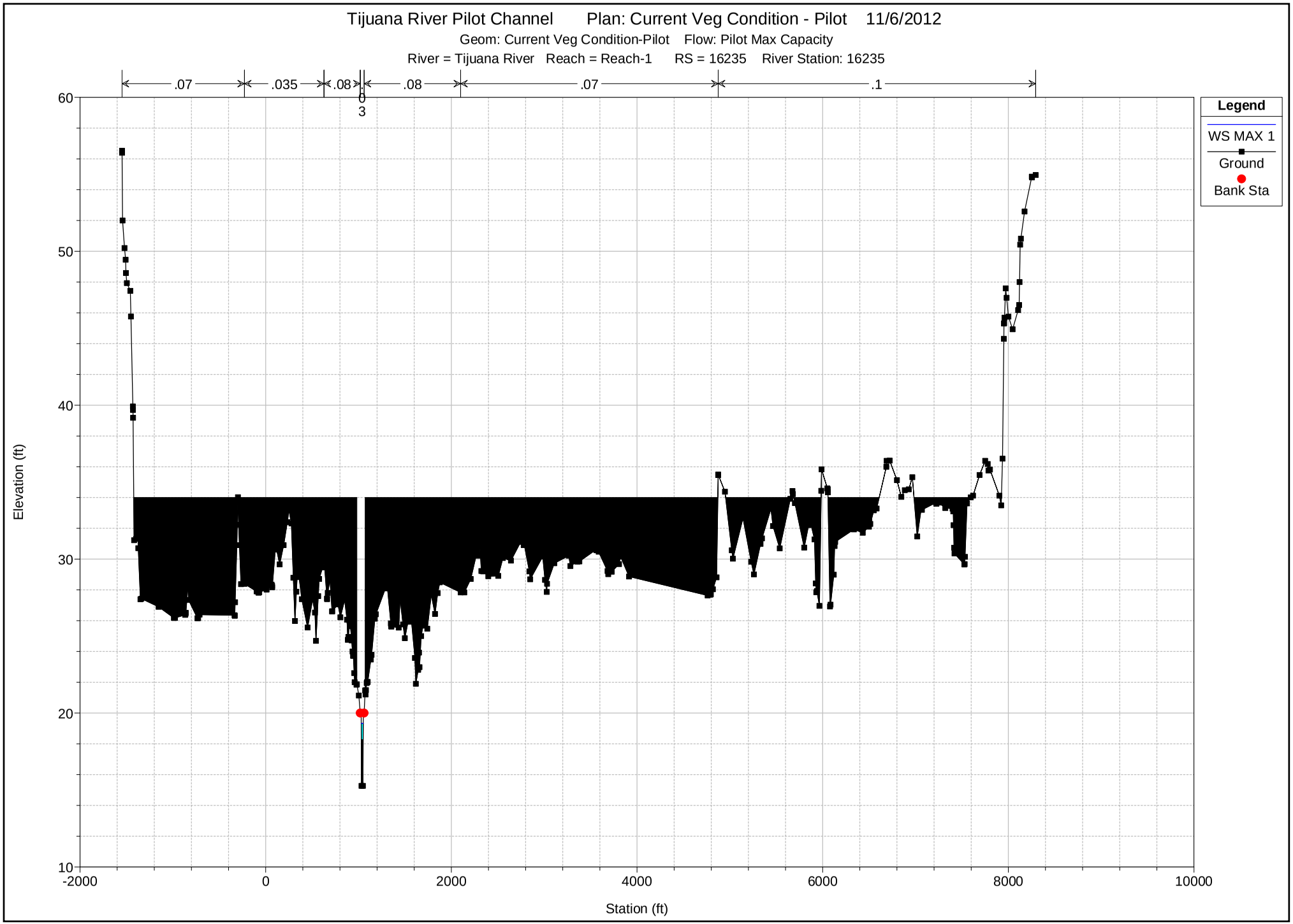
2408.4
2489.75
2500
2623.27
3774.45
3863.17
3912.68*
3962.20*
4011.72
4099
4179.24
4289.33
5269.88

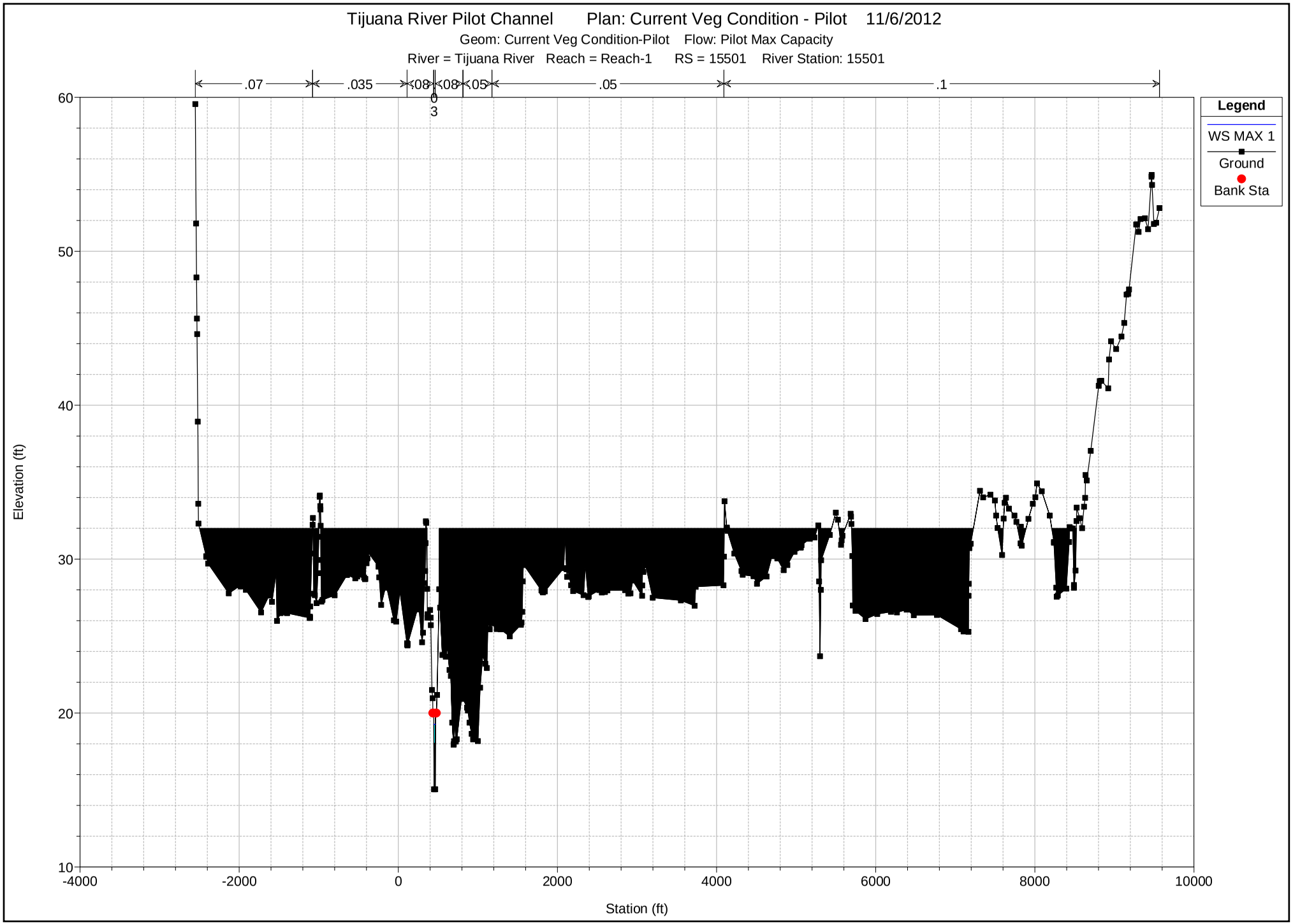
DETAILED HYDRAULIC RESULTS FOR CURRENT VEGETATED CONDITION MODEL

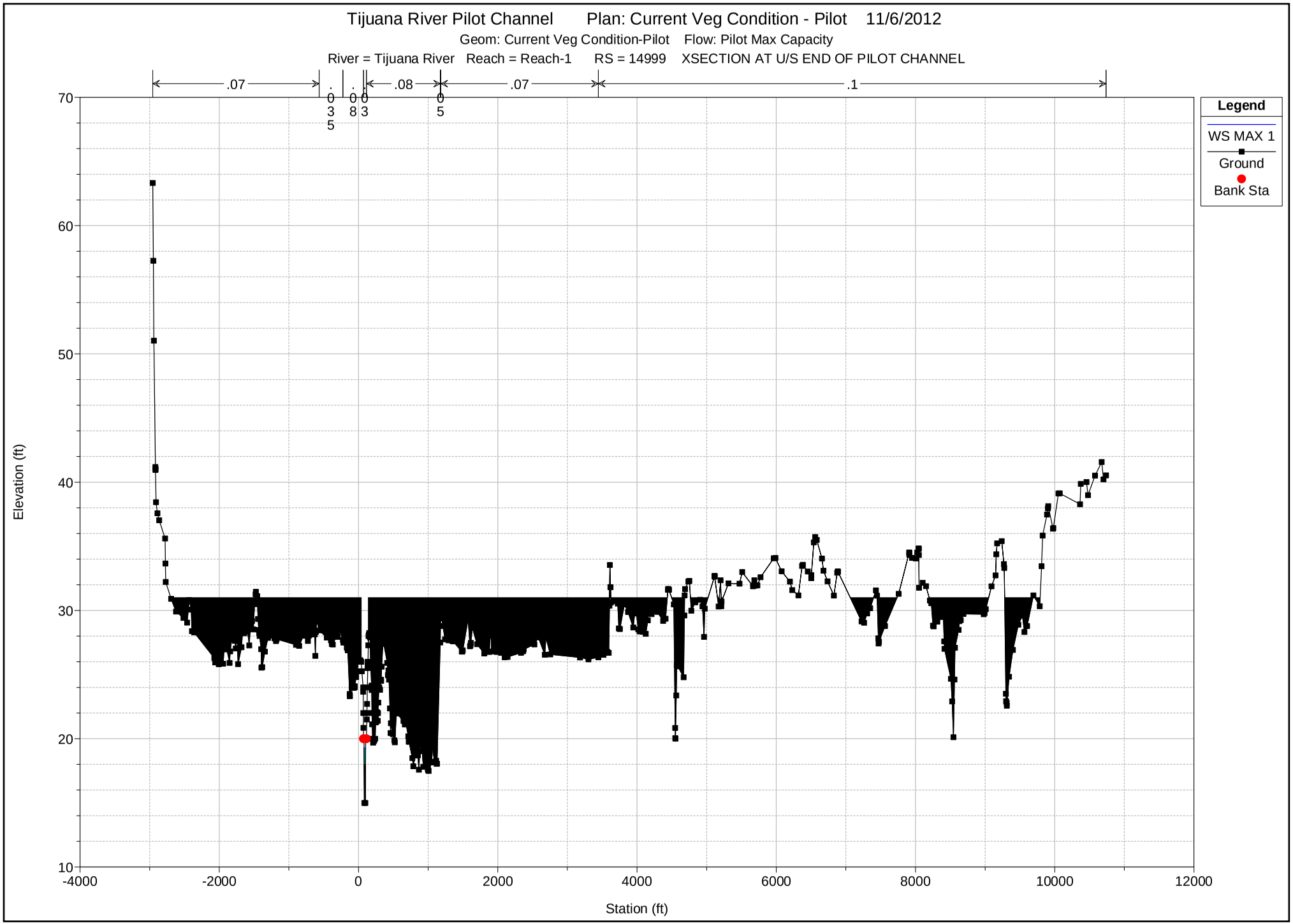
HEC-RAS Plan: CurrentVeg-Pilot River: Tijuana River Reach: Reach-1 Profile: MAX1_Q=10

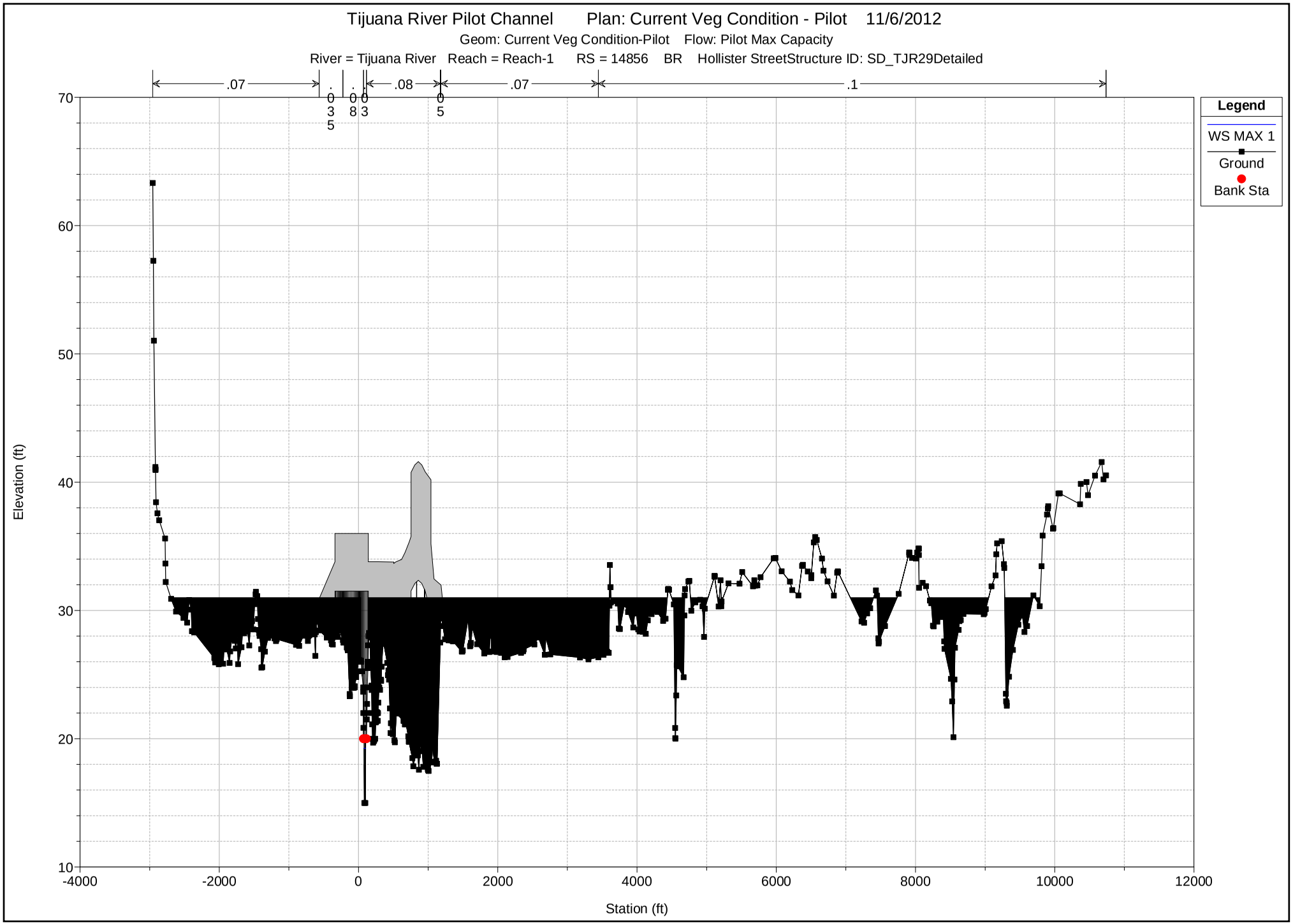
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	16734	MAX1_Q=10	10.00	18.46	19.39	18.66	19.39	0.000235	0.51	19.63	21.93	0.09
Reach-1	16235	MAX1_Q=10	10.00	18.27	19.32	18.47	19.33	0.000087	0.45	22.14	21.91	0.08
Reach-1	15501	MAX1_Q=10	10.00	18.05	19.27	18.25	19.27	0.000101	0.39	25.47	21.82	0.06
Reach-1	14999	MAX1_Q=10	10.00	18.00	19.26	18.20	19.26	0.000050	0.38	26.28	21.84	0.06
Reach-1	14856		Bridge									
Reach-1	14688	MAX1_Q=10	10.00	17.90	19.25	18.10	19.25	0.000074	0.36	28.11	21.92	0.06
Reach-1	14541	MAX1_Q=10	10.00	17.85	19.24	18.05	19.24	0.000036	0.34	29.10	22.02	0.05
Reach-1	13805	MAX1_Q=10	10.00	17.68	19.23	17.88	19.23	0.000028	0.32	31.04	21.08	0.05
Reach-1	134.5	MAX1_Q=10	10.00	17.48	19.21	17.70	19.21	0.000042	0.32	31.12	18.65	0.04
Reach-1	127.5	MAX1_Q=10	10.00	17.20	19.20	17.40	19.20	0.000011	0.23	42.75	23.00	0.03
Reach-1	122	MAX1_Q=10	10.00	17.00	19.19	17.20	19.19	0.000008	0.21	47.40	23.46	0.03
Reach-1	120	MAX1_Q=10	10.00	16.91	19.19	17.11	19.19	0.000007	0.20	49.35	23.56	0.02
Reach-1	119	MAX1_Q=10	10.00	16.92	19.19	17.12	19.19	0.000007	0.20	49.08	23.44	0.02
Reach-1	108	MAX1_Q=10	10.00	18.04	19.17	18.22	19.17	0.000416	0.39	25.72	23.00	0.06
Reach-1	97.5	MAX1_Q=10	10.00	17.60	18.59	17.78	18.59	0.000642	0.44	22.48	23.00	0.08
Reach-1	93	MAX1_Q=10	10.00	17.43	17.90	17.61	17.92	0.007303	0.94	10.65	22.95	0.24
Reach-1	90	MAX1_Q=10	10.00	9.77	10.44	10.16	10.46	0.010105	0.96	10.40	28.12	0.28
Reach-1	85	MAX1_Q=10	10.00	6.39	7.50	6.87	7.51	0.002556	0.67	14.92	24.54	0.15
Reach-1	77.5	MAX1_Q=10	10.00	4.00	4.81	4.41	4.84	0.003704	1.20	8.30	15.12	0.29

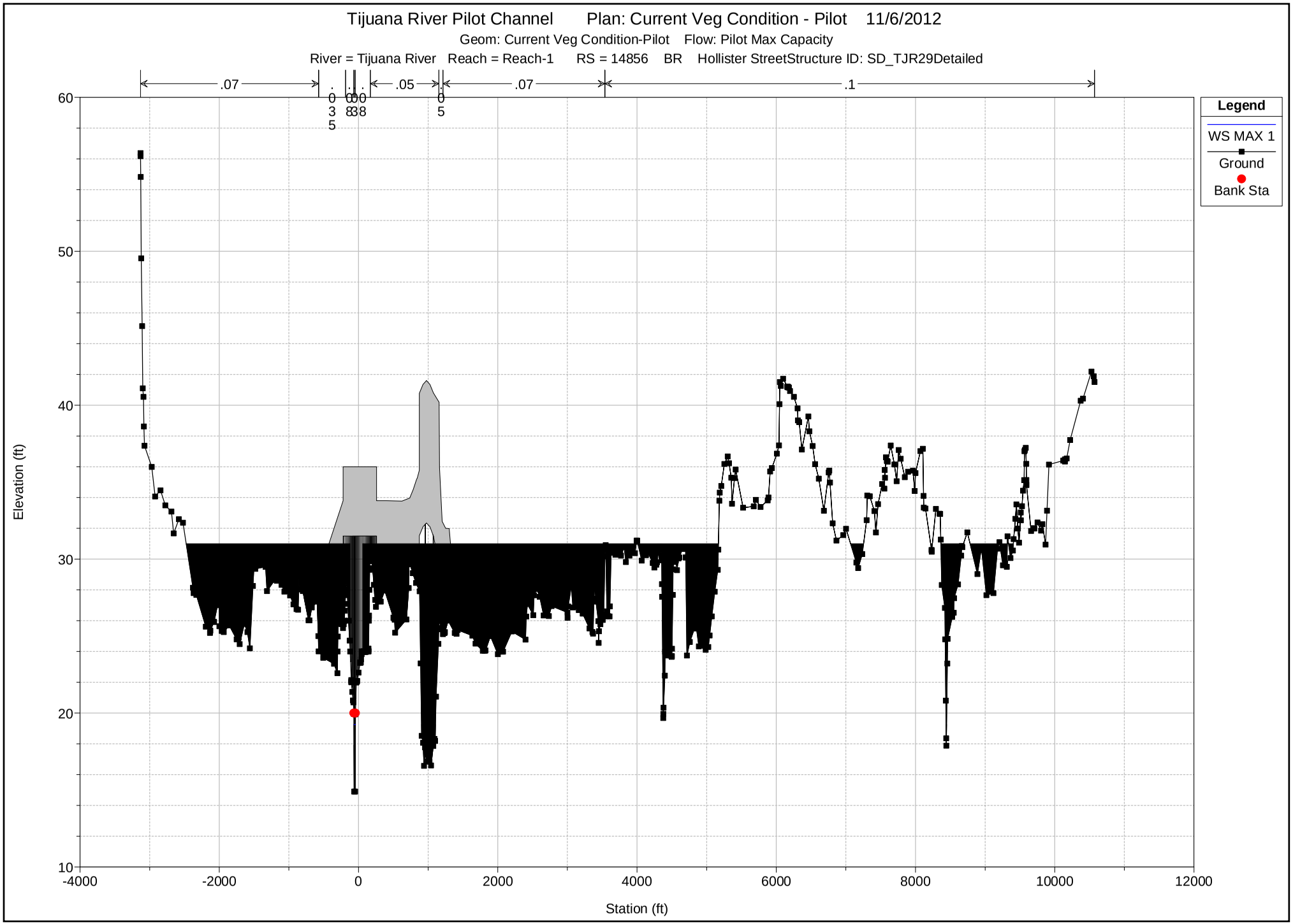

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 16734 River Station: 16734
.07
.035
.000838
.05
.07
.1
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
70
60
50
40
30
20
10
-2000
0
2000
4000
6000
8000
10000

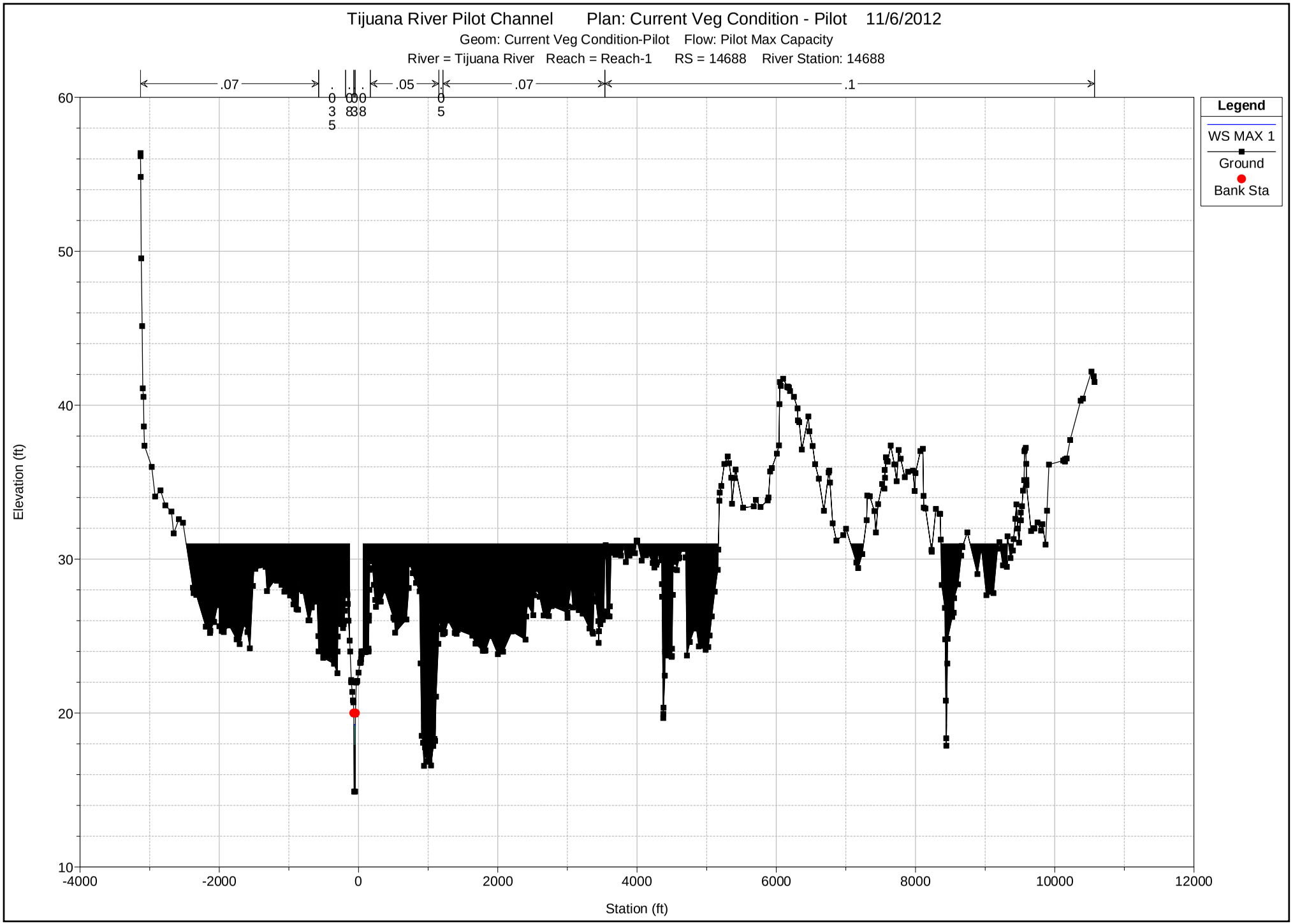

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 16235 River Station: 16235
.07
.035
.08
0
3
.08
.07
.1
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
50
40
30
20
10
-2000
0
2000
4000
6000
8000
10000

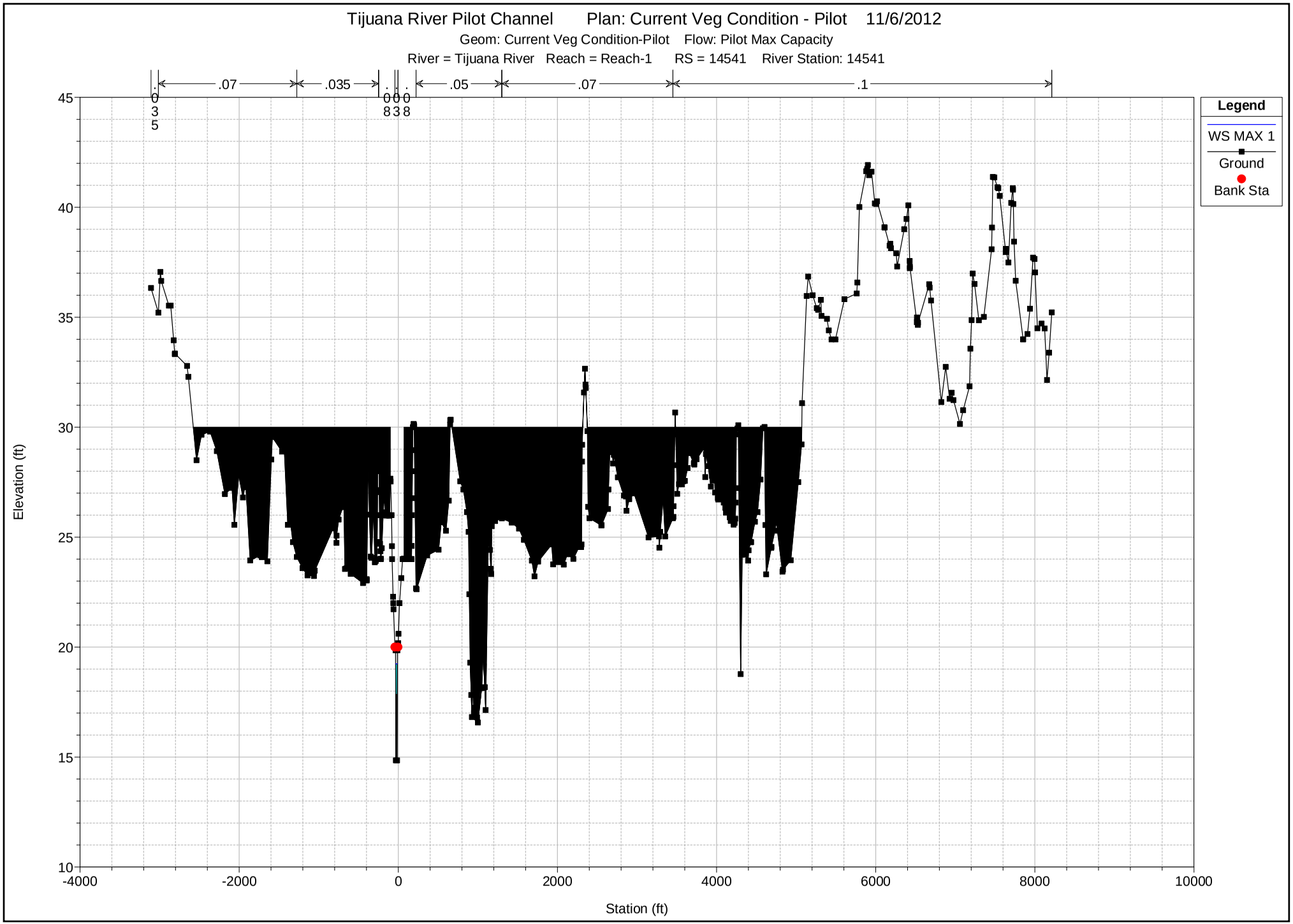

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 15501 River Station: 15501
.07
.035
.08
.08
.05
.05
.1
0
3
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
50
40
30
20
10
-4000
-2000
0
2000
4000
6000
8000
10000

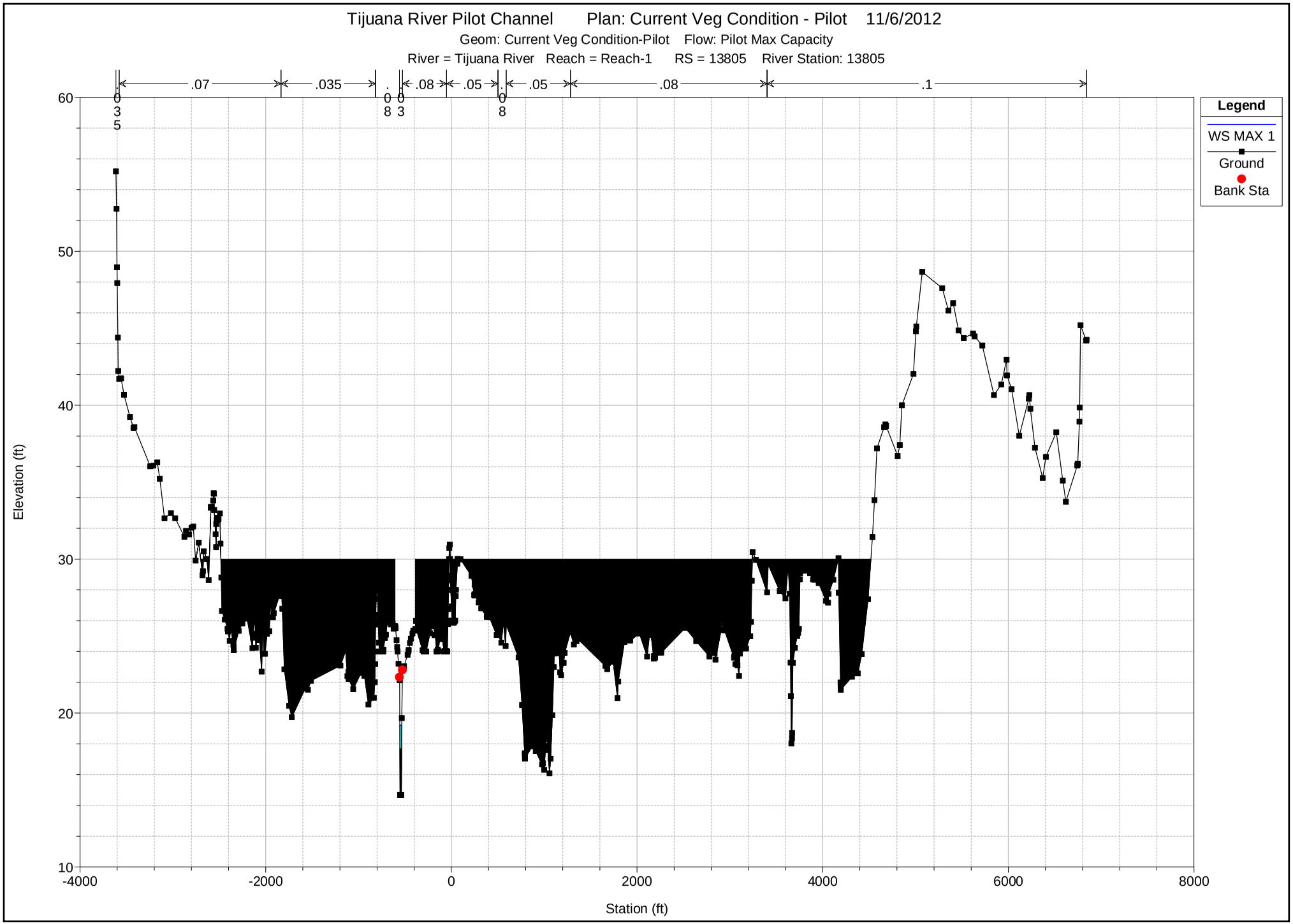

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14999 XSECTION AT U/S END OF PILOT CHANNEL
.07
.035
.035
.08
.03
.05
.07
.1
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
70
60
50
40
30
20
10
-4000
-2000
0
2000
4000
6000
8000
10000
12000
Station (ft)

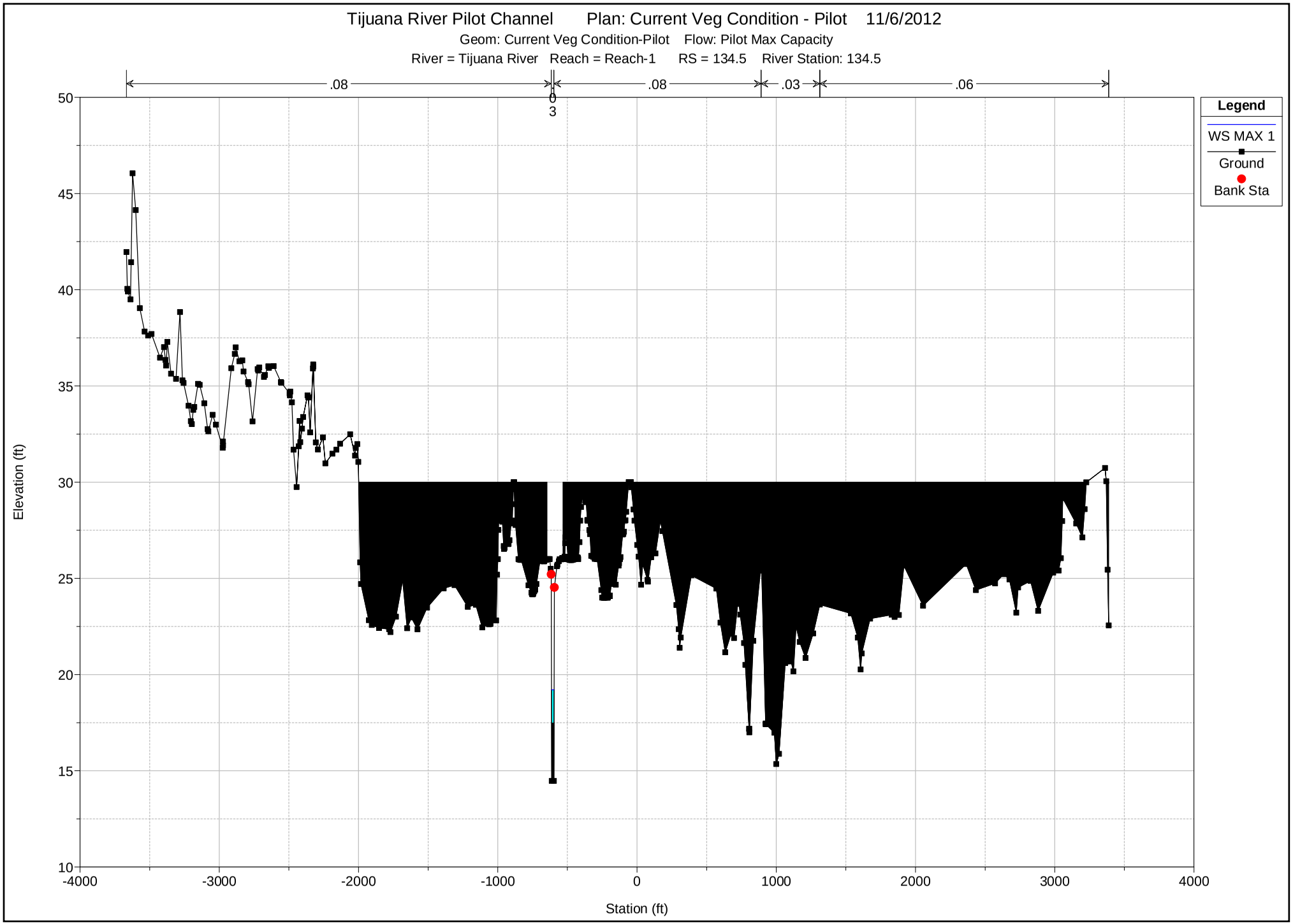

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.03
.05
.07
.1
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
70
60
50
40
30
20
10
-4000
-2000
0
2000
4000
6000
8000
10000
12000

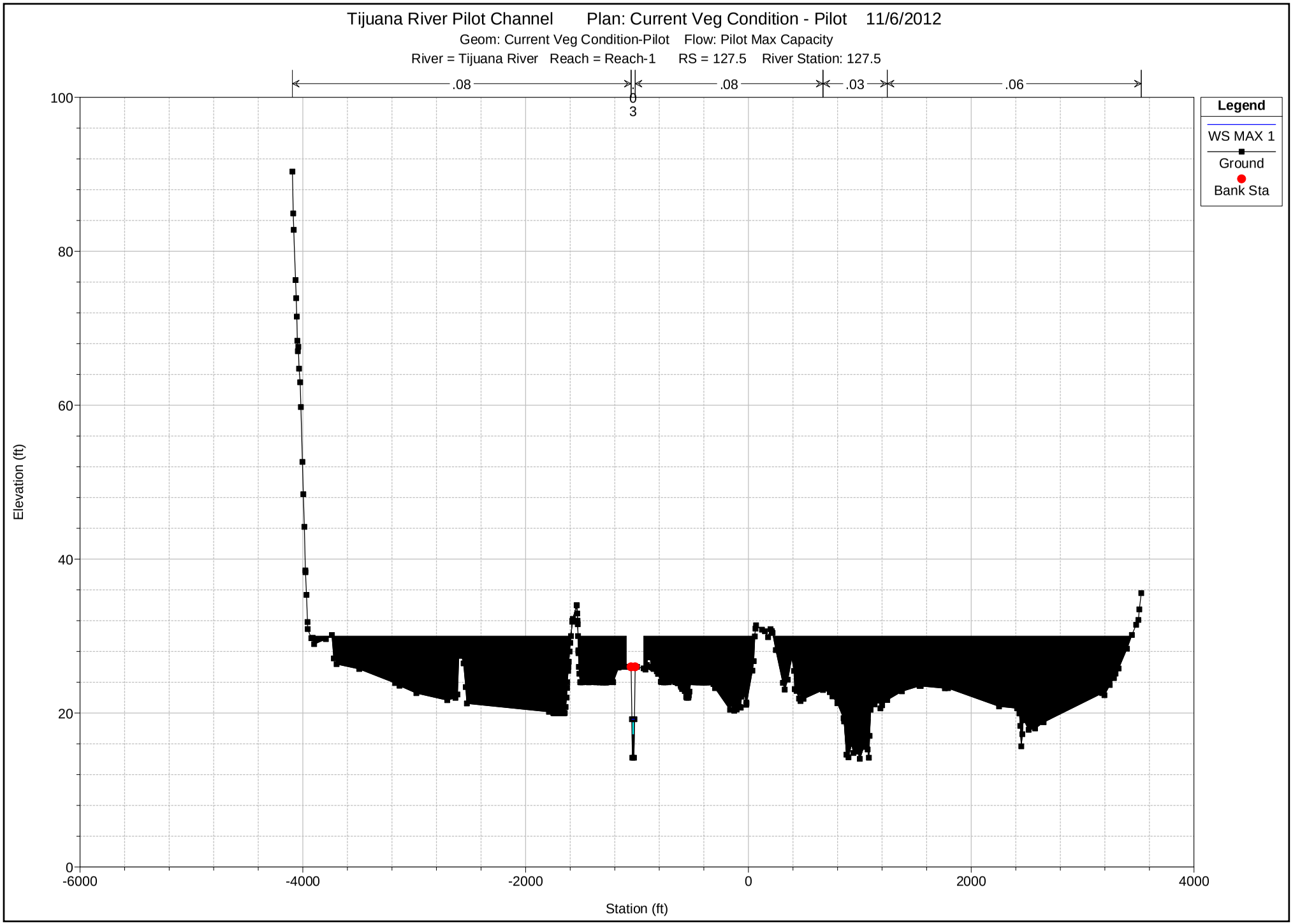

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.05
.07
.1
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
50
40
30
20
10
-4000
-2000
0
2000
4000
6000
8000
10000
12000

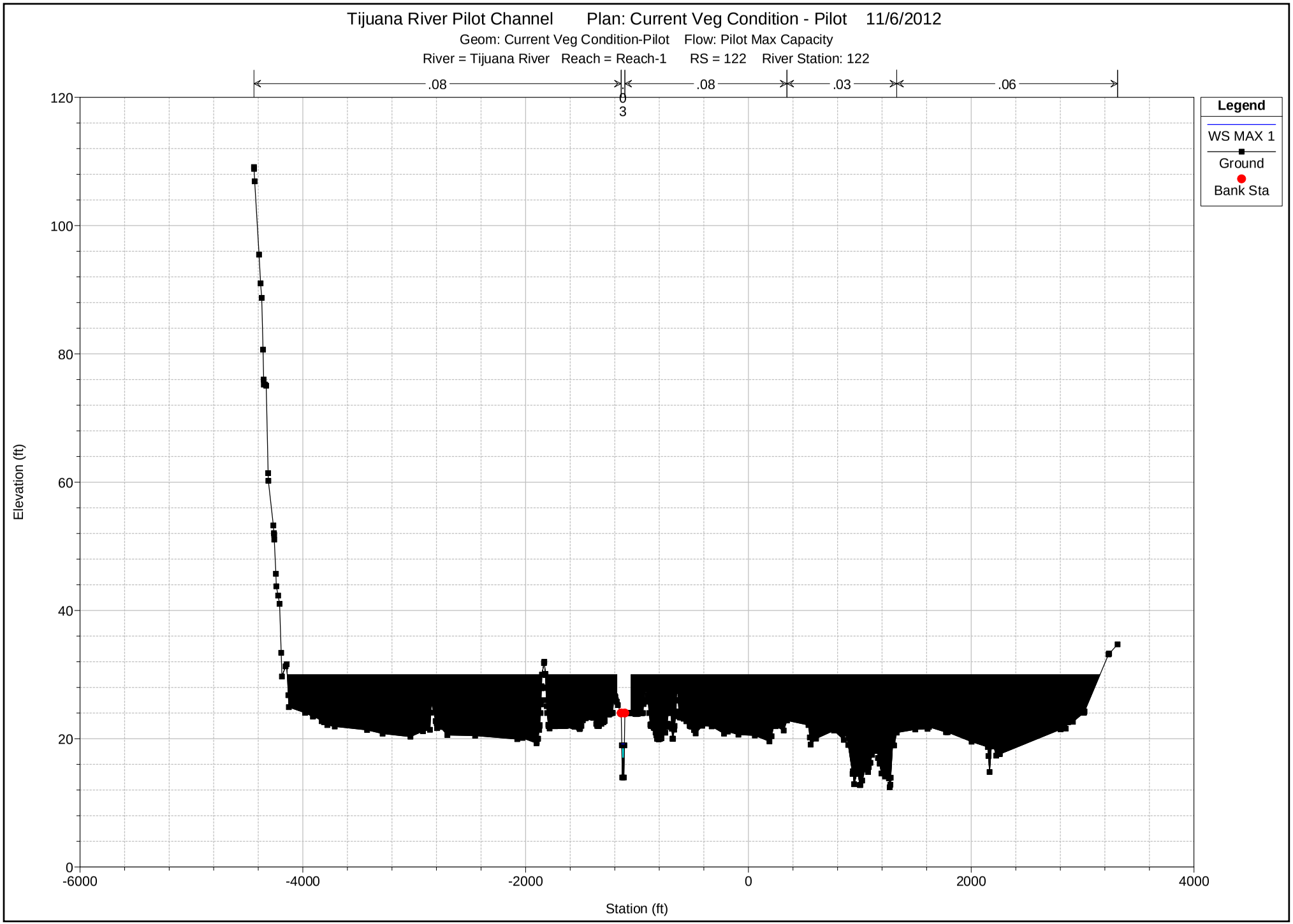

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14688 River Station: 14688
.07
.035
.08
.08
.05
.07
.1
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
50
40
30
20
10
-4000
-2000
0
2000
4000
6000
8000
10000
12000

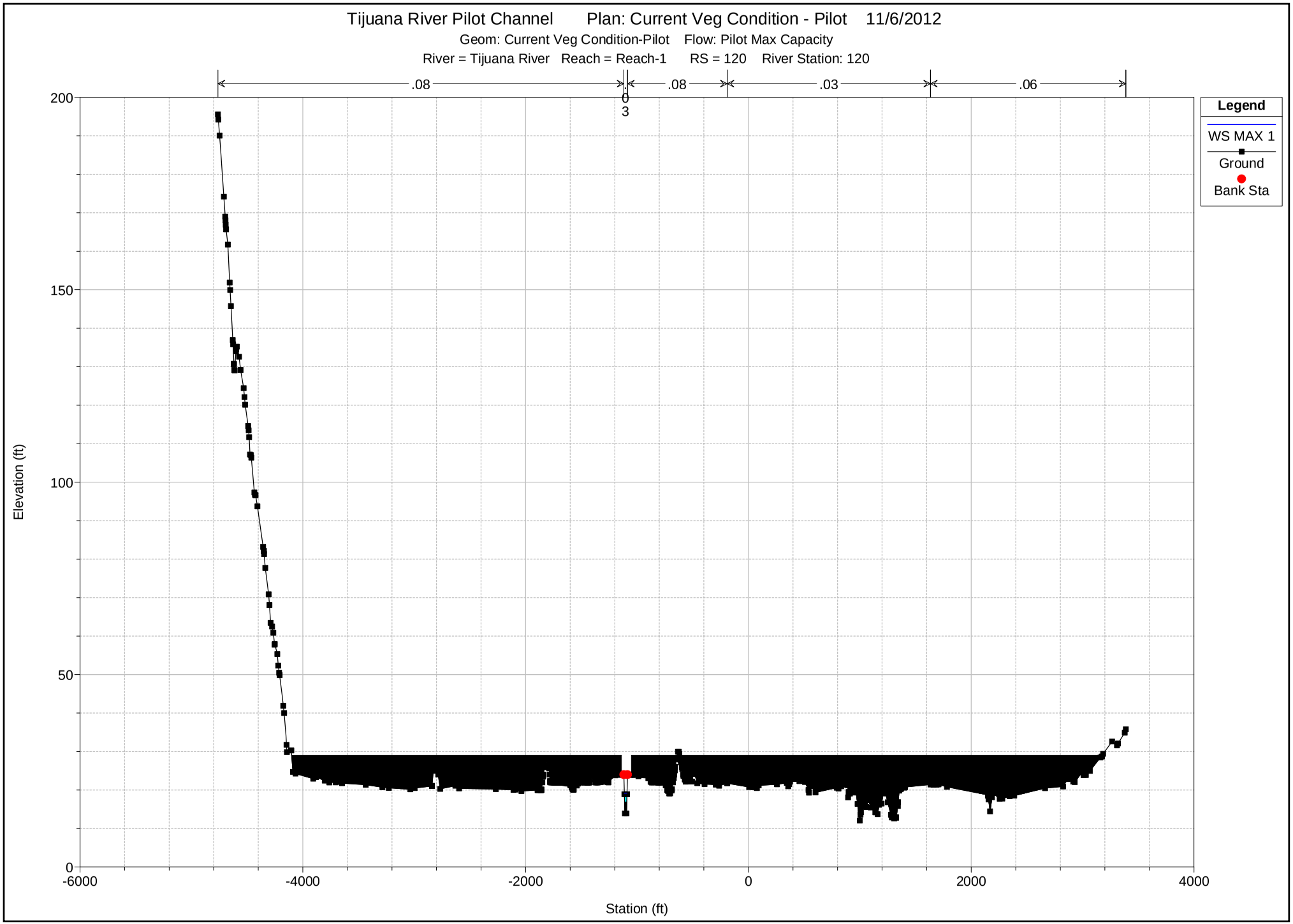

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14541 River Station: 14541
.035
.07
.035
.05
.07
.1
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
45
40
35
30
25
20
15
10
-4000
-2000
0
2000
4000
6000
8000
10000

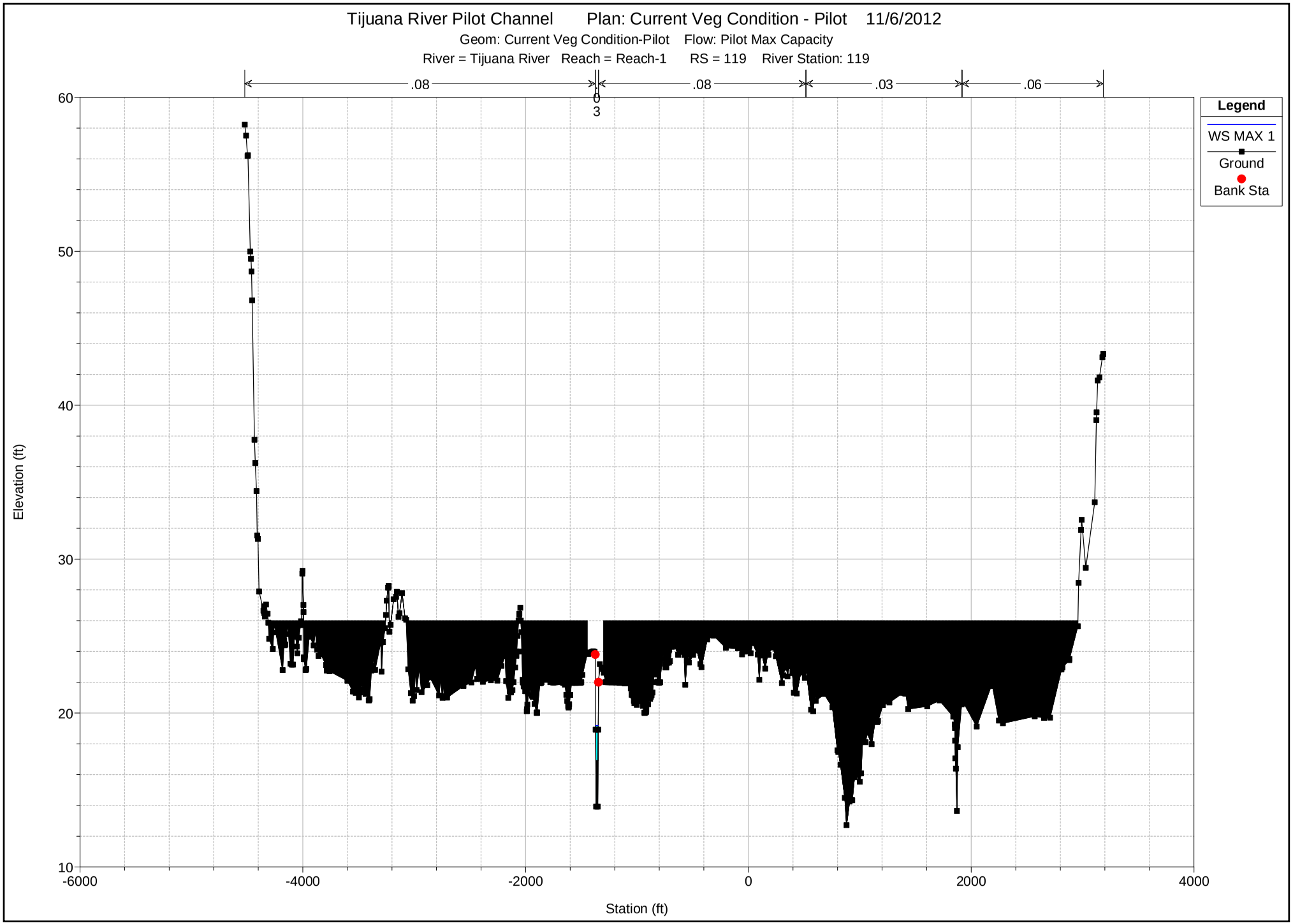

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 13805 River Station: 13805
.035
.07
.035
.08
.03
.08
.05
.08
.05
.08
.1
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
50
40
30
20
10
-4000
-2000
0
2000
4000
6000
8000

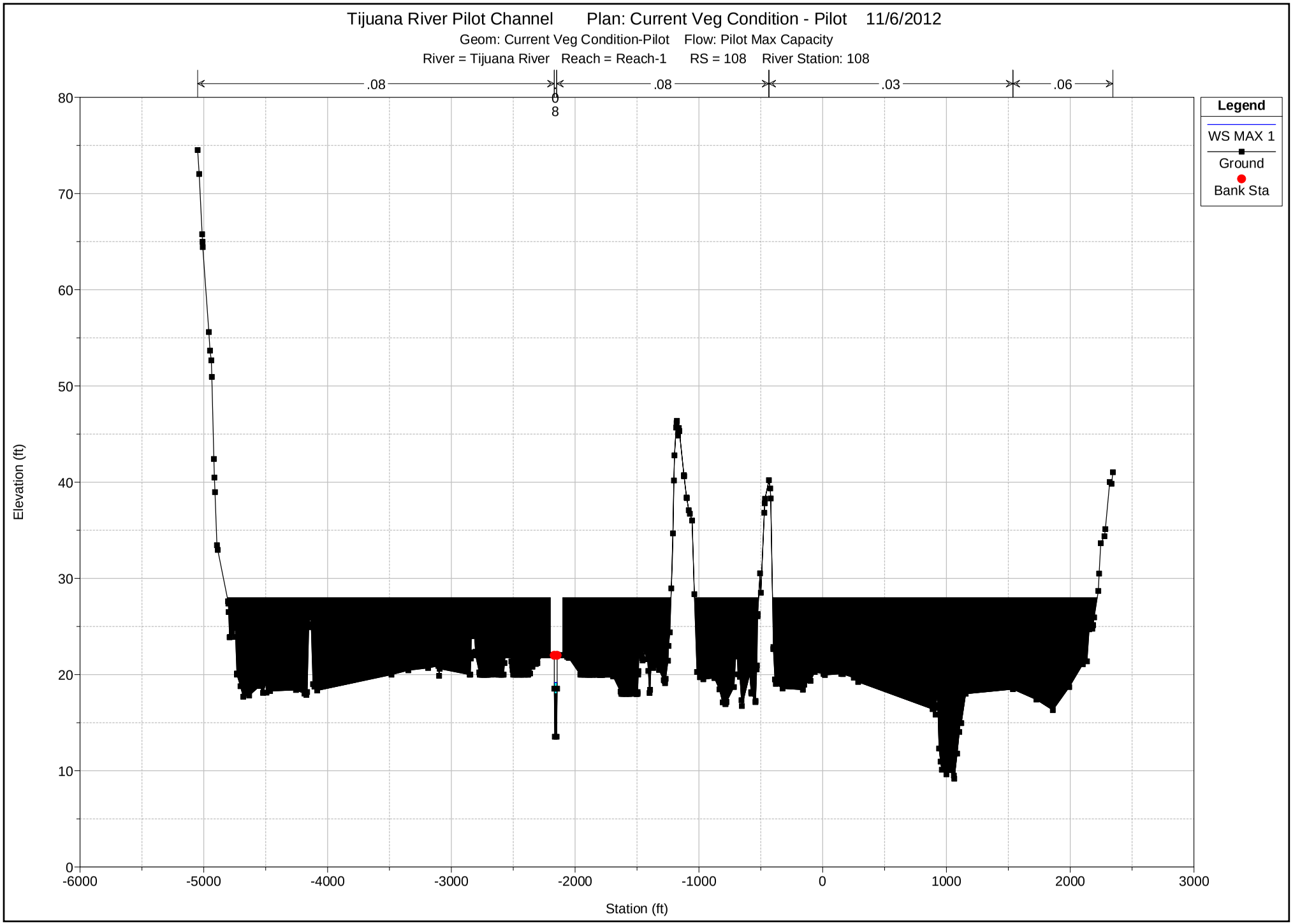

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 134.5 River Station: 134.5
.08
.08
.03
.06
0
3
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
50
45
40
35
30
25
20
15
10
-4000
-3000
-2000
-1000
0
1000
2000
3000
4000

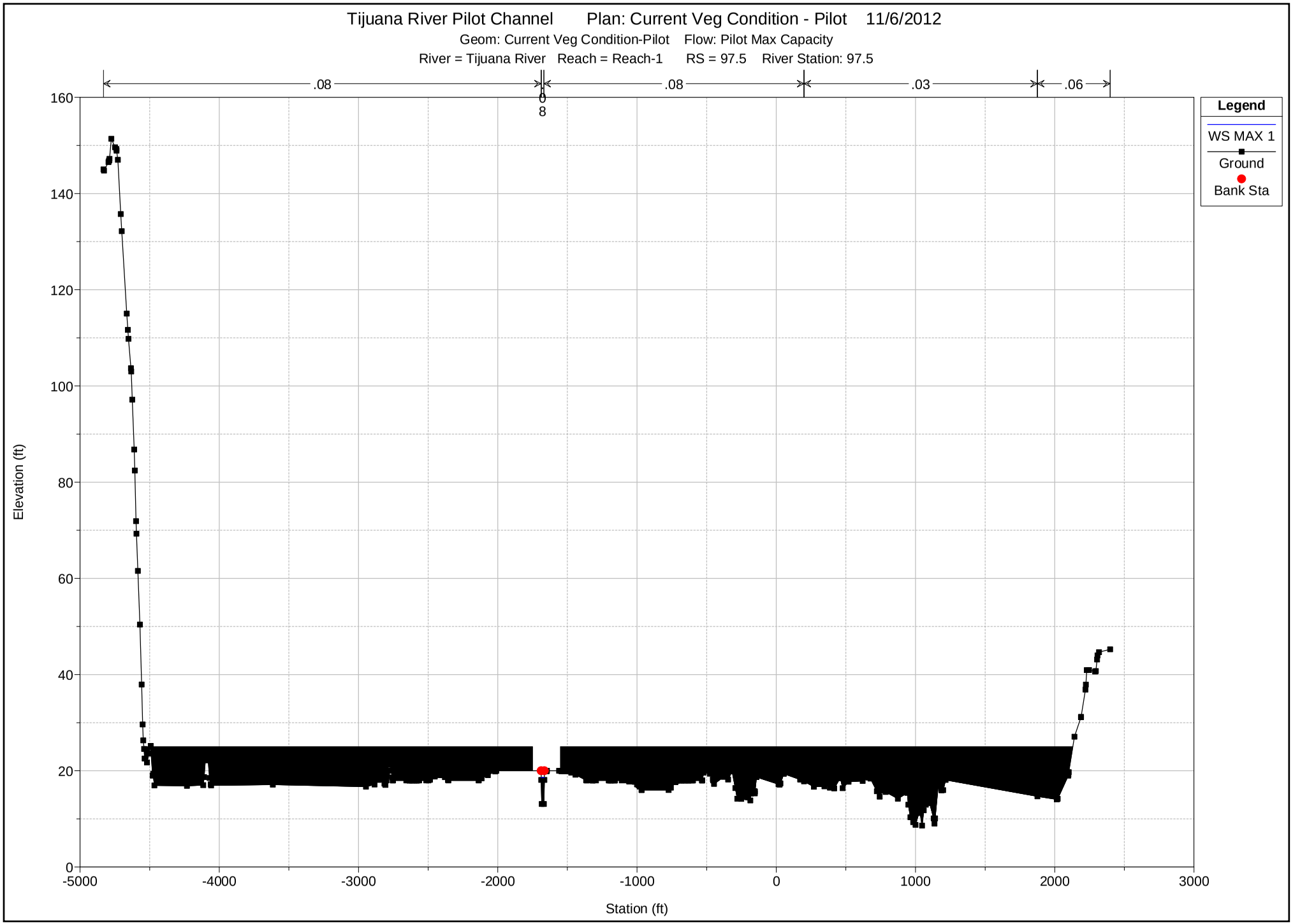

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 127.5 River Station: 127.5
.08
.08
.03
.06
0
3
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
100
80
60
40
20
0
-6000
-4000
-2000
0
2000
4000

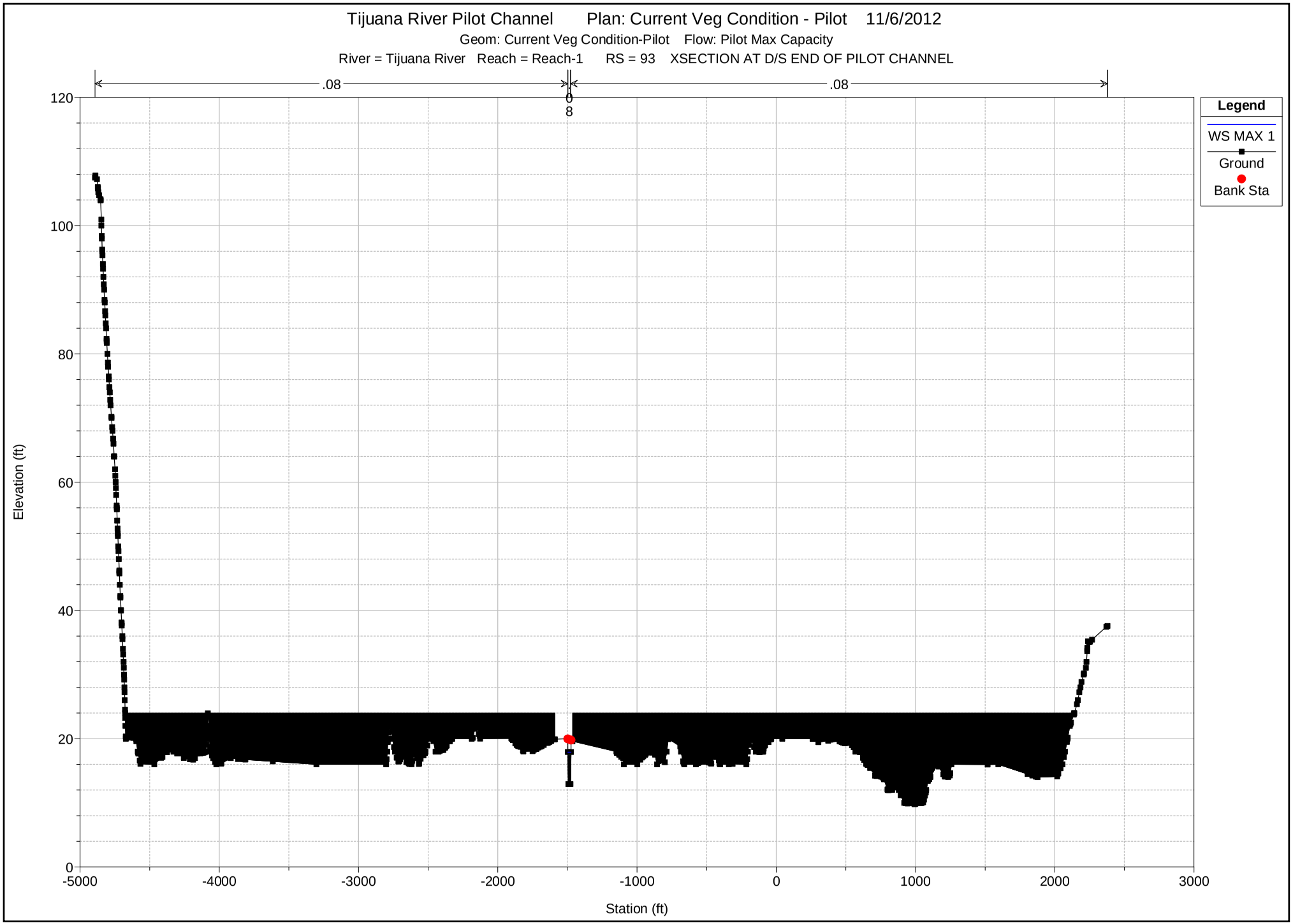

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 122 River Station: 122
.08
.08
.03
.06
0
3
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
120
100
80
60
40
20
0
-6000
-4000
-2000
0
2000
4000

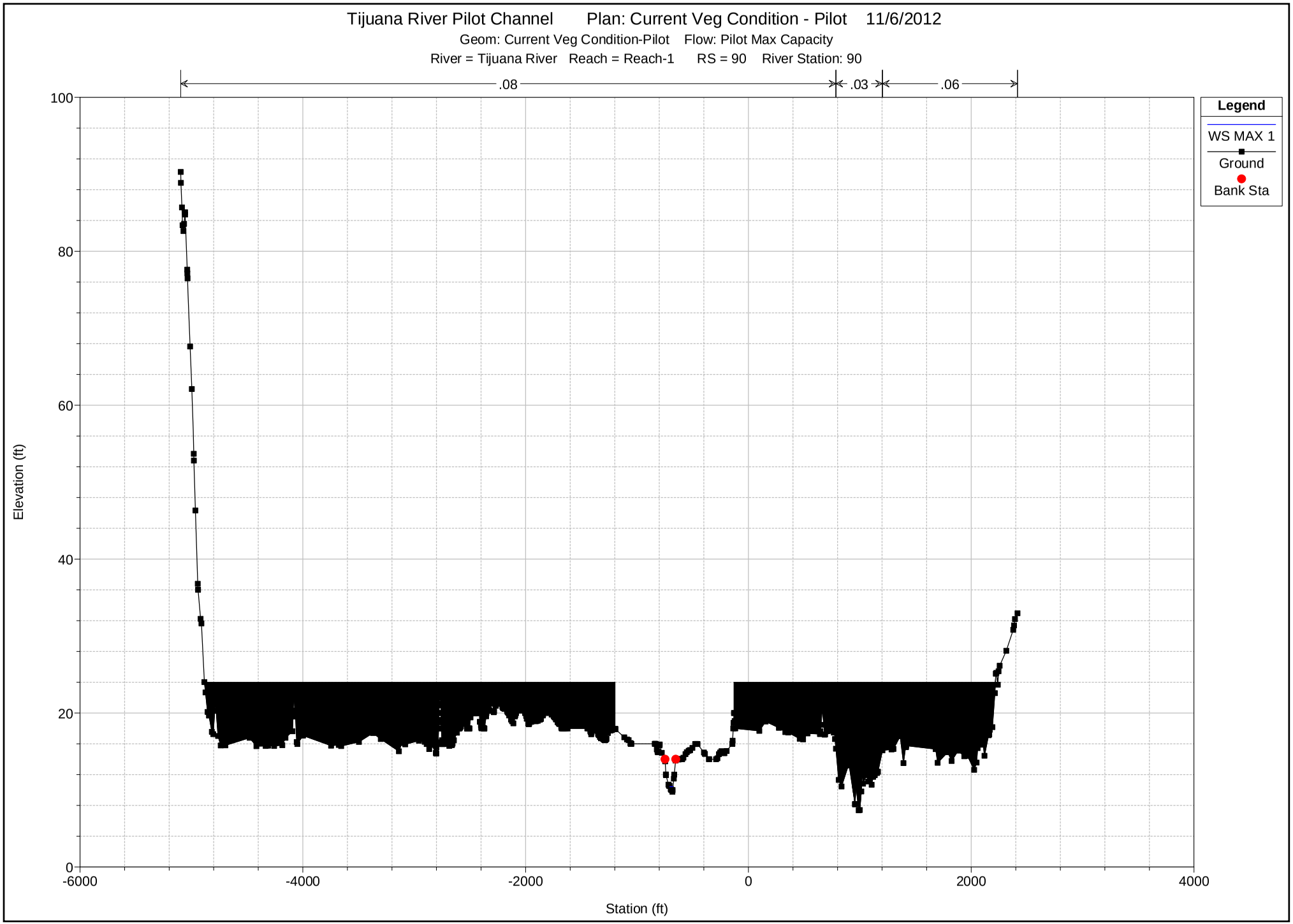

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 120 River Station: 120
.08
.08
.03
.06
0
3
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
200
150
100
50
0
-6000
-4000
-2000
0
2000
4000
Station (ft)

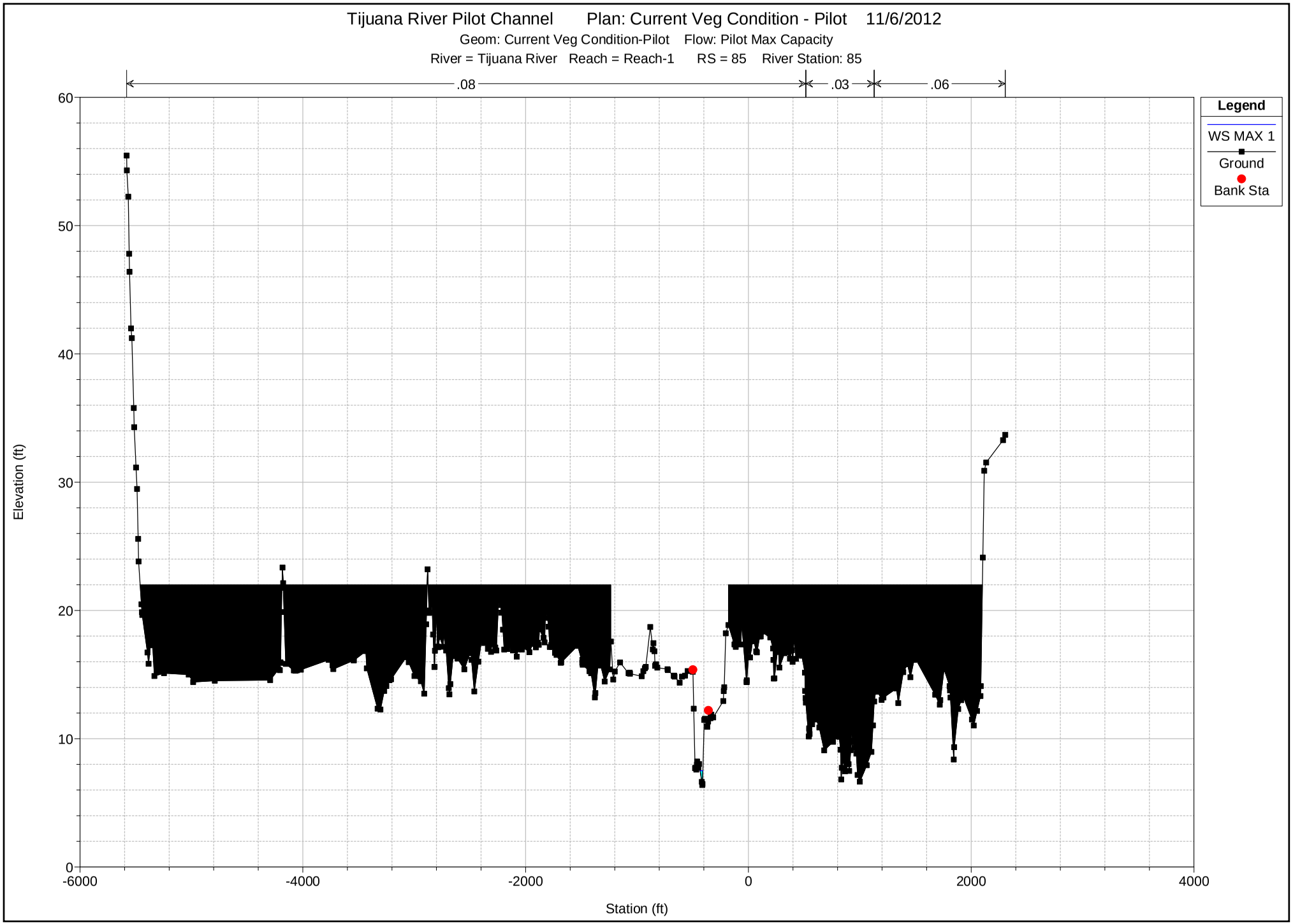

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 119 River Station: 119
.08
.08
.03
.06
0
3
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
60
50
40
30
20
10
-6000
-4000
-2000
0
2000
4000
Station (ft)

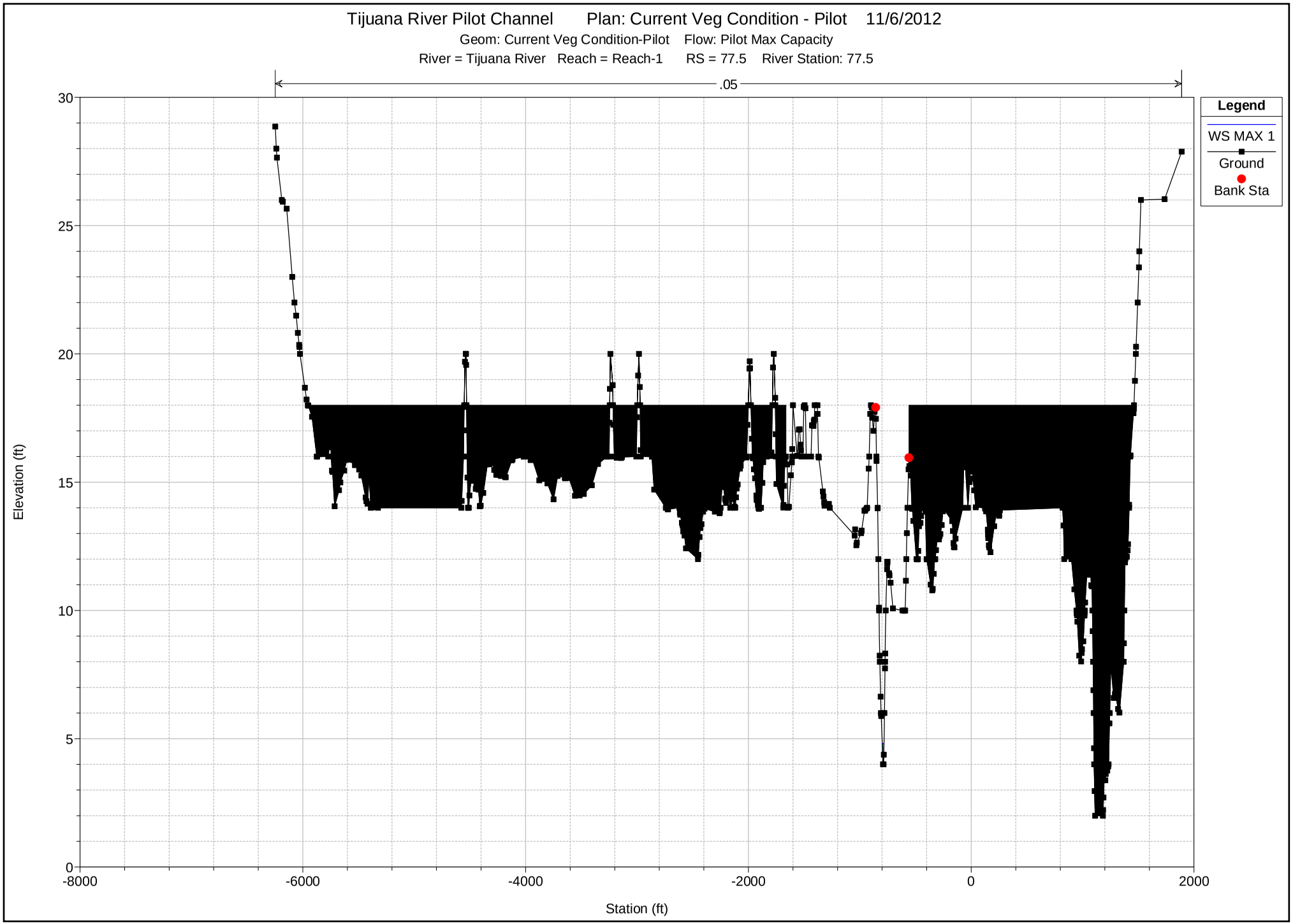

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 108 River Station: 108
.08
.08
.03
.06
0
8
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
80
70
60
50
40
30
20
10
0
-6000
-5000
-4000
-3000
-2000
-1000
0
1000
2000
3000

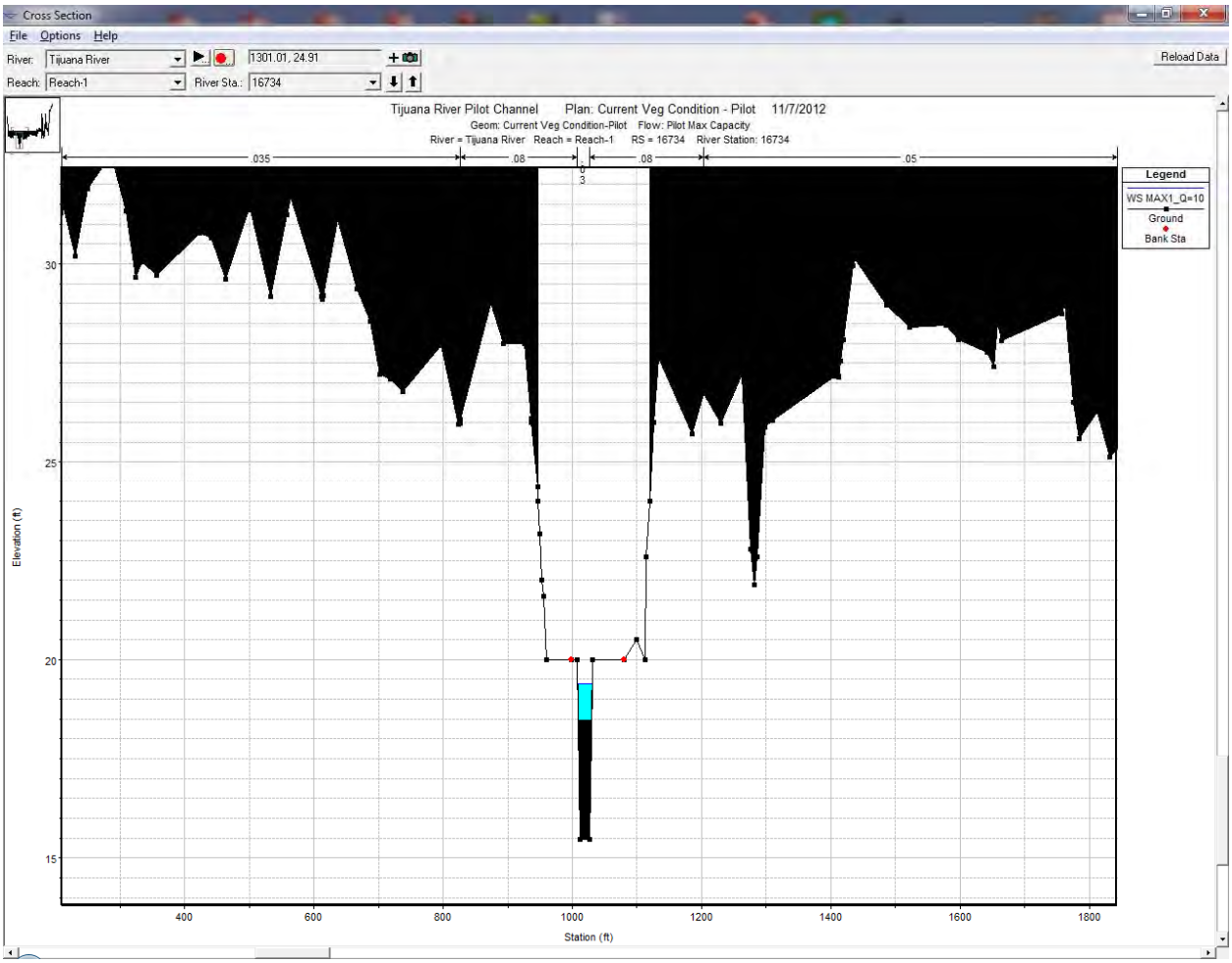

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 97.5 River Station: 97.5
.08
.08
.03
.06
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
160
140
120
100
80
60
40
20
0
-5000
-4000
-3000
-2000
-1000
0
1000
2000
3000

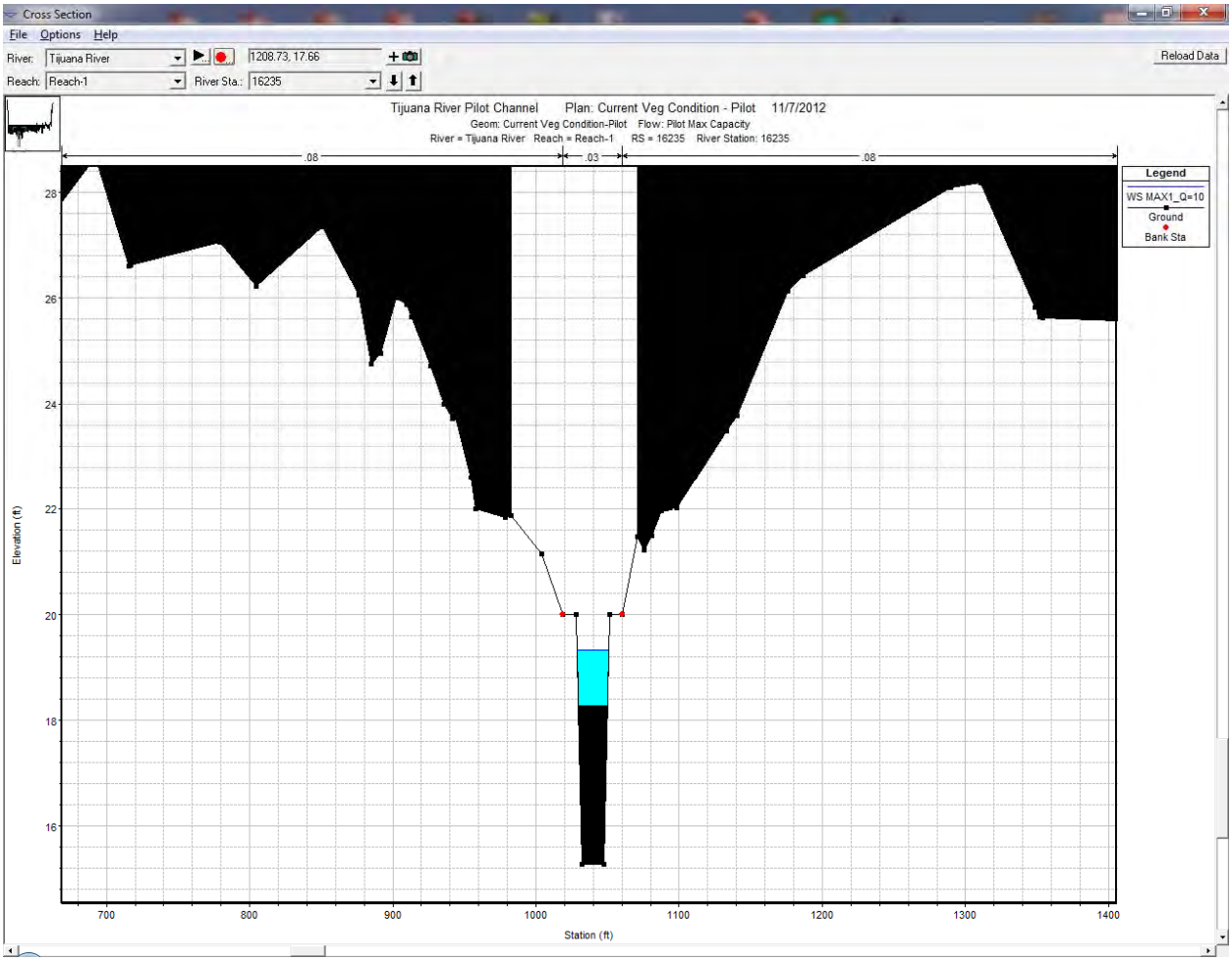

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 93 XSECTION AT D/S END OF PILOT CHANNEL
.08
0
8
.08
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-5000
-4000
-3000
-2000
-1000
0
1000
2000
3000
Station (ft)

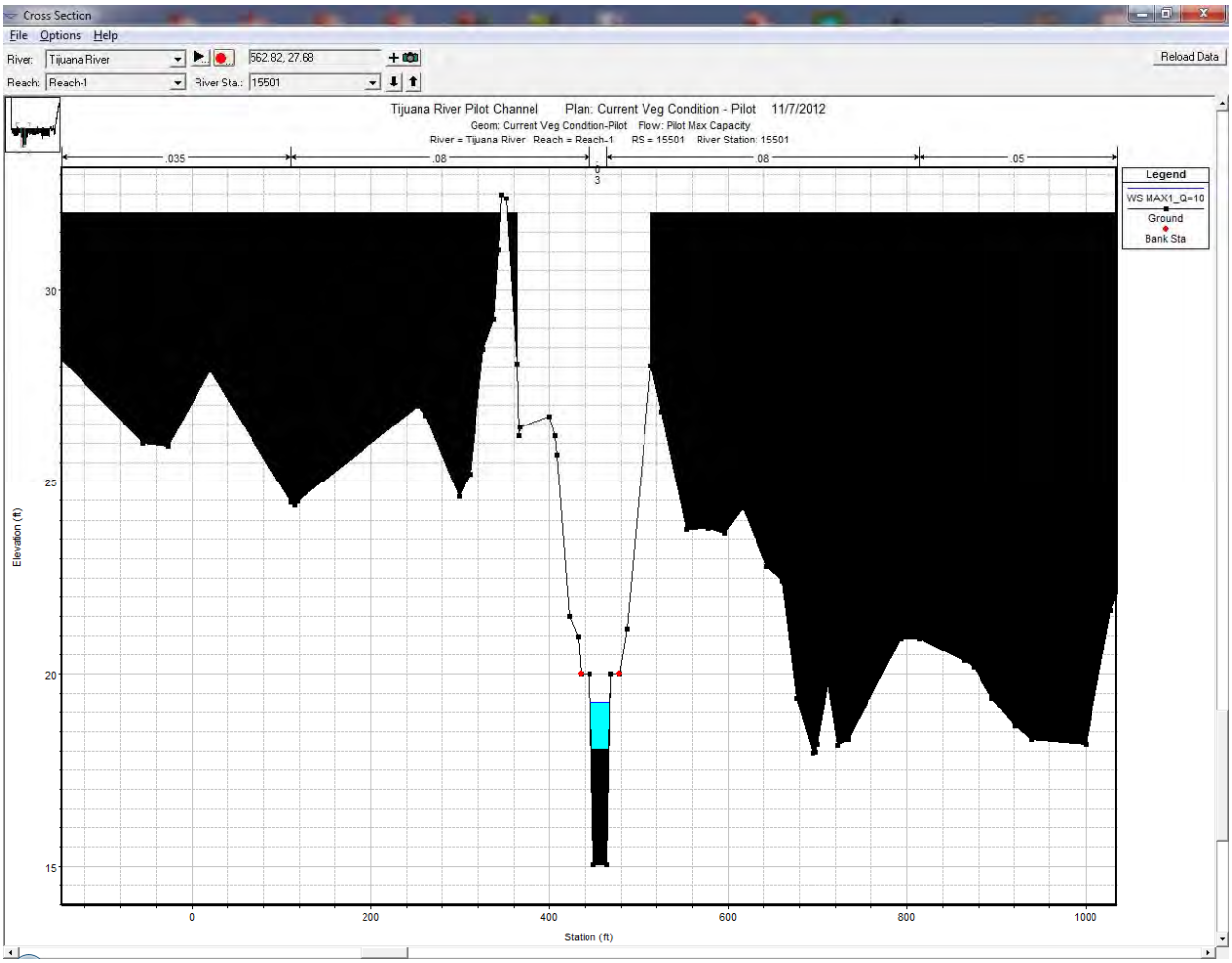

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 90 River Station: 90
.08
.03
.06
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
100
80
60
40
20
0
-6000
-4000
-2000
0
2000
4000

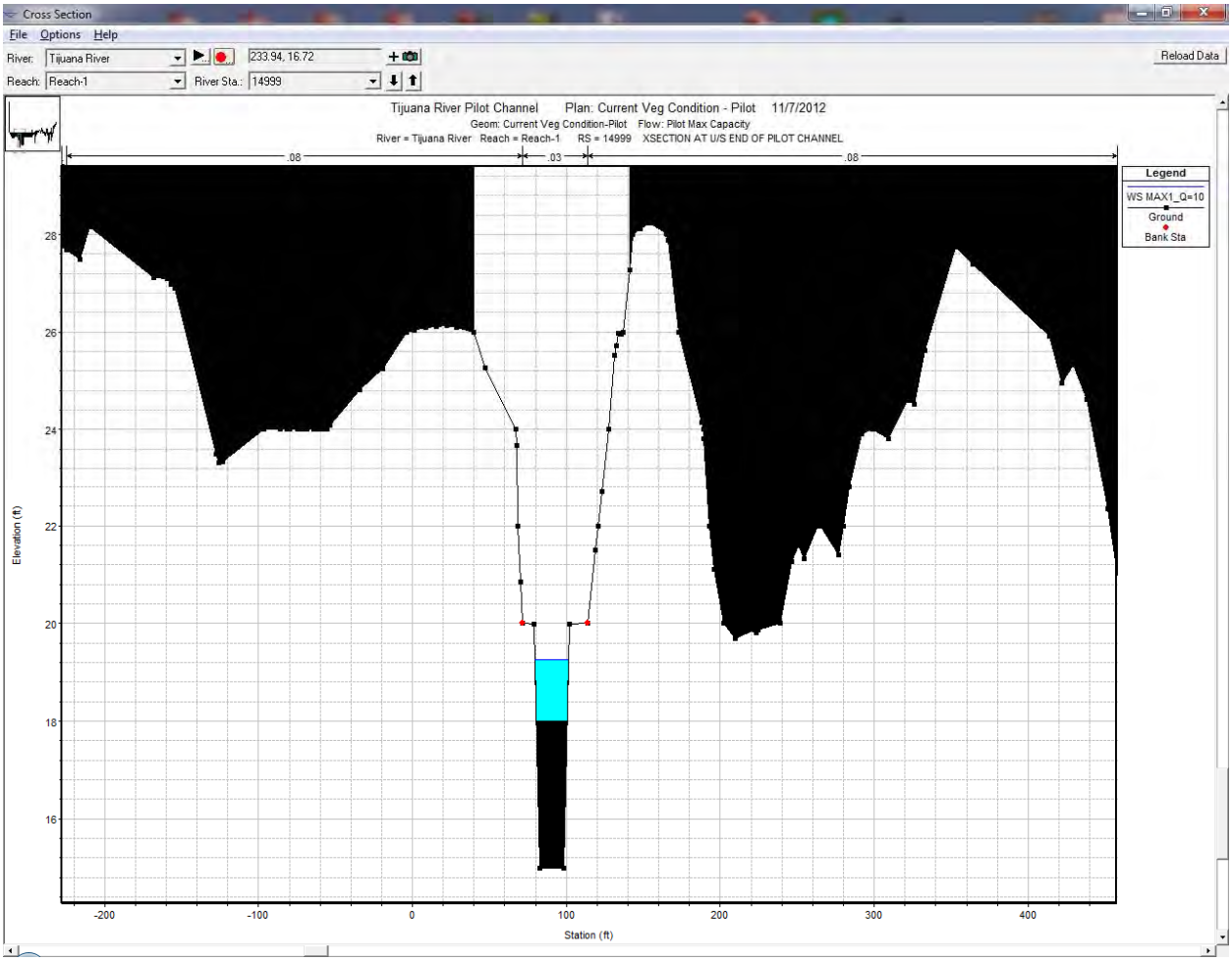

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 85 River Station: 85
.08
.03
.06
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
50
40
30
20
10
0
-6000
-4000
-2000
0
2000
4000

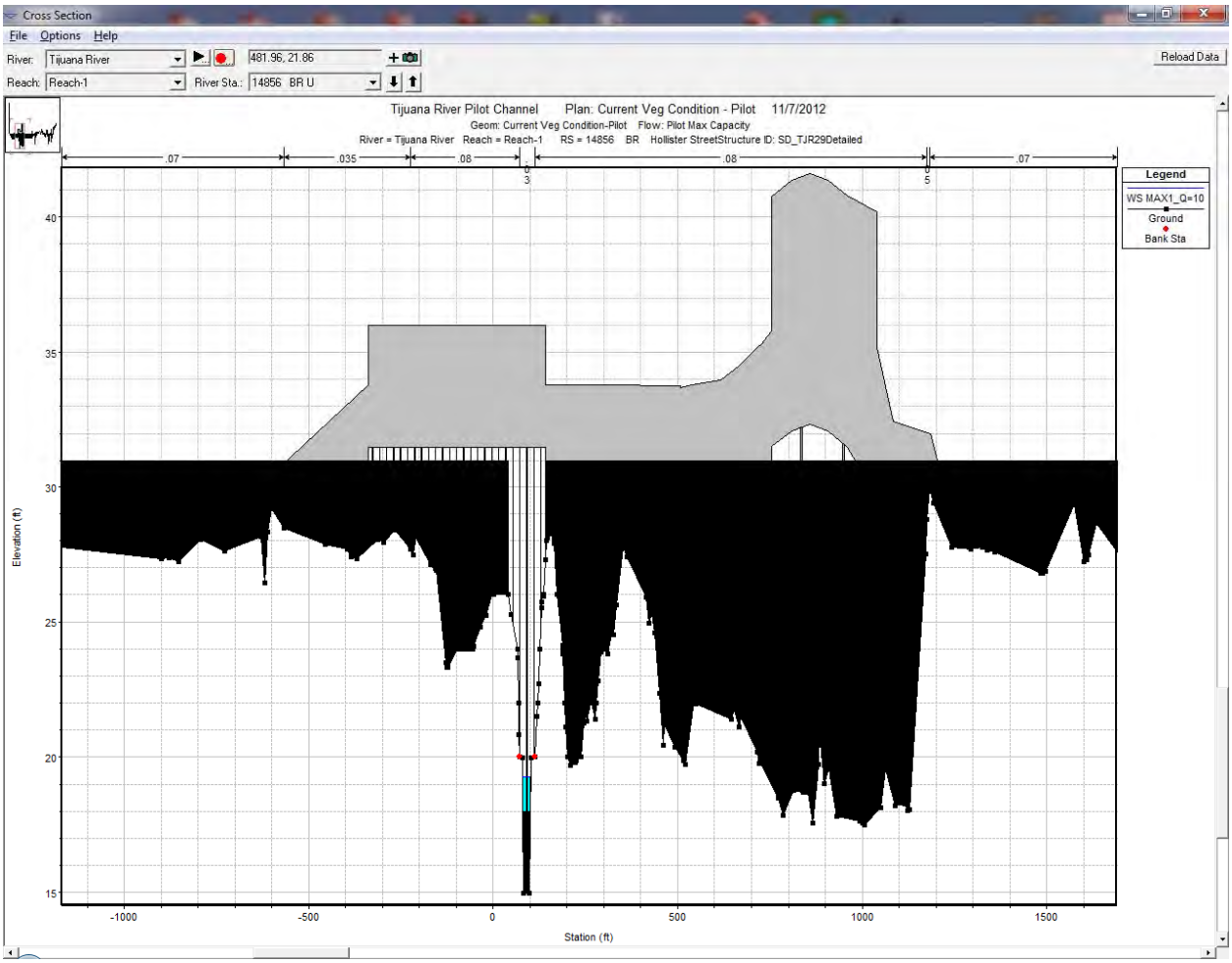

Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/6/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 77.5 River Station: 77.5
.05
Legend
WS MAX 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
30
25
20
15
10
5
0
-8000
-6000
-4000
-2000
0
2000

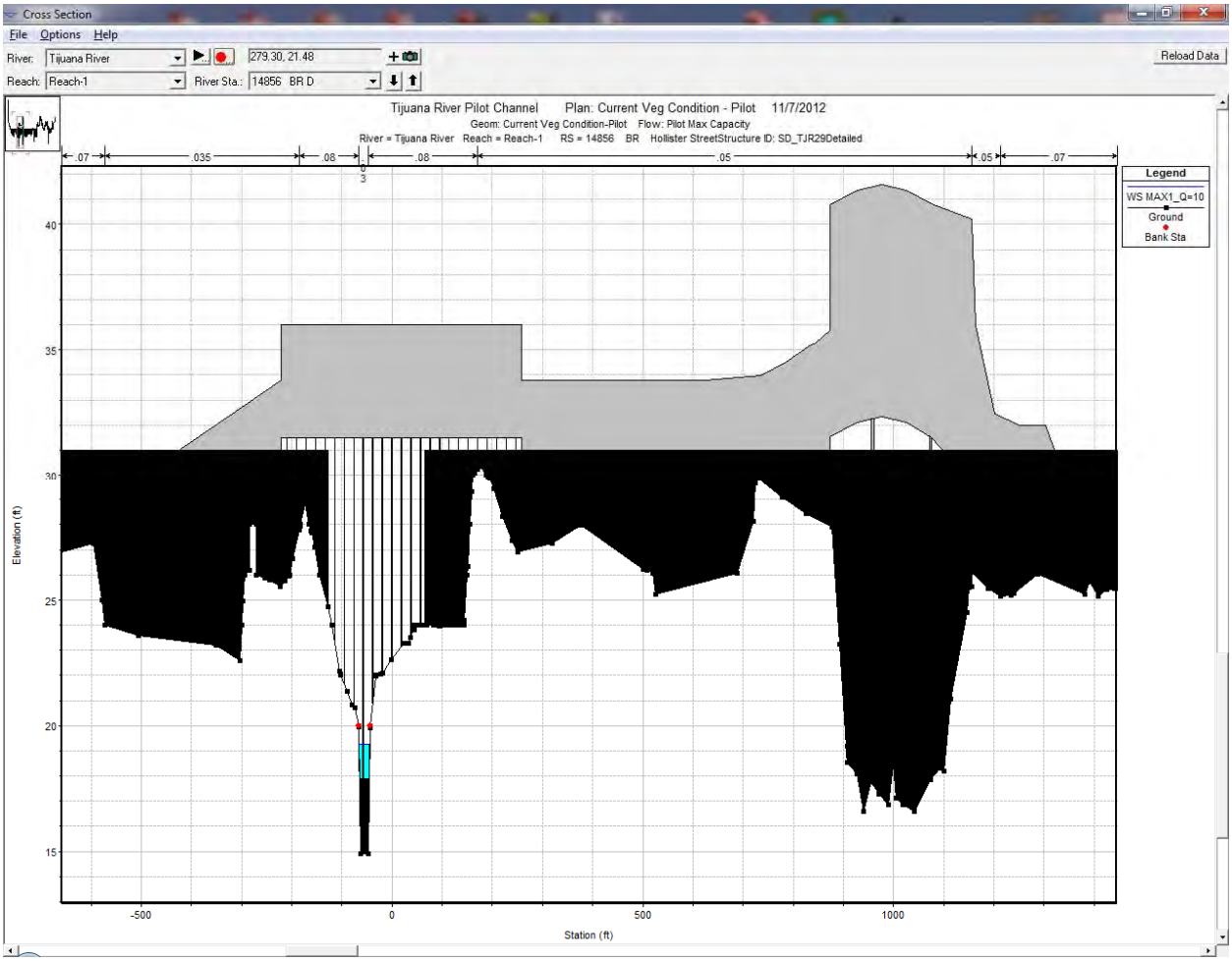

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 16734
1301.01, 24.91
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 16734 River Station: 16734
.035
.08
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

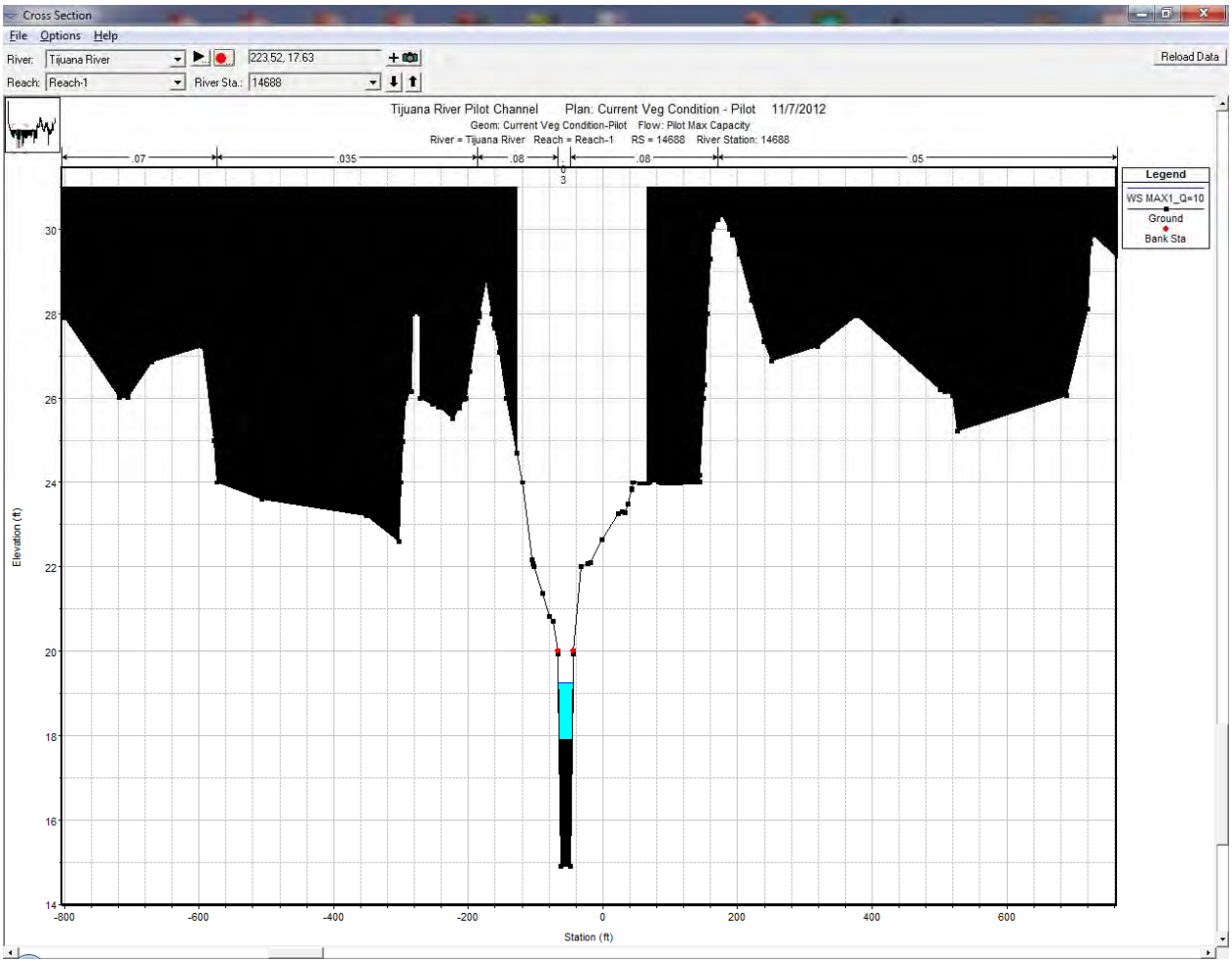

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 16235
1208.73, 17.66
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 16235 River Station: 16235
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

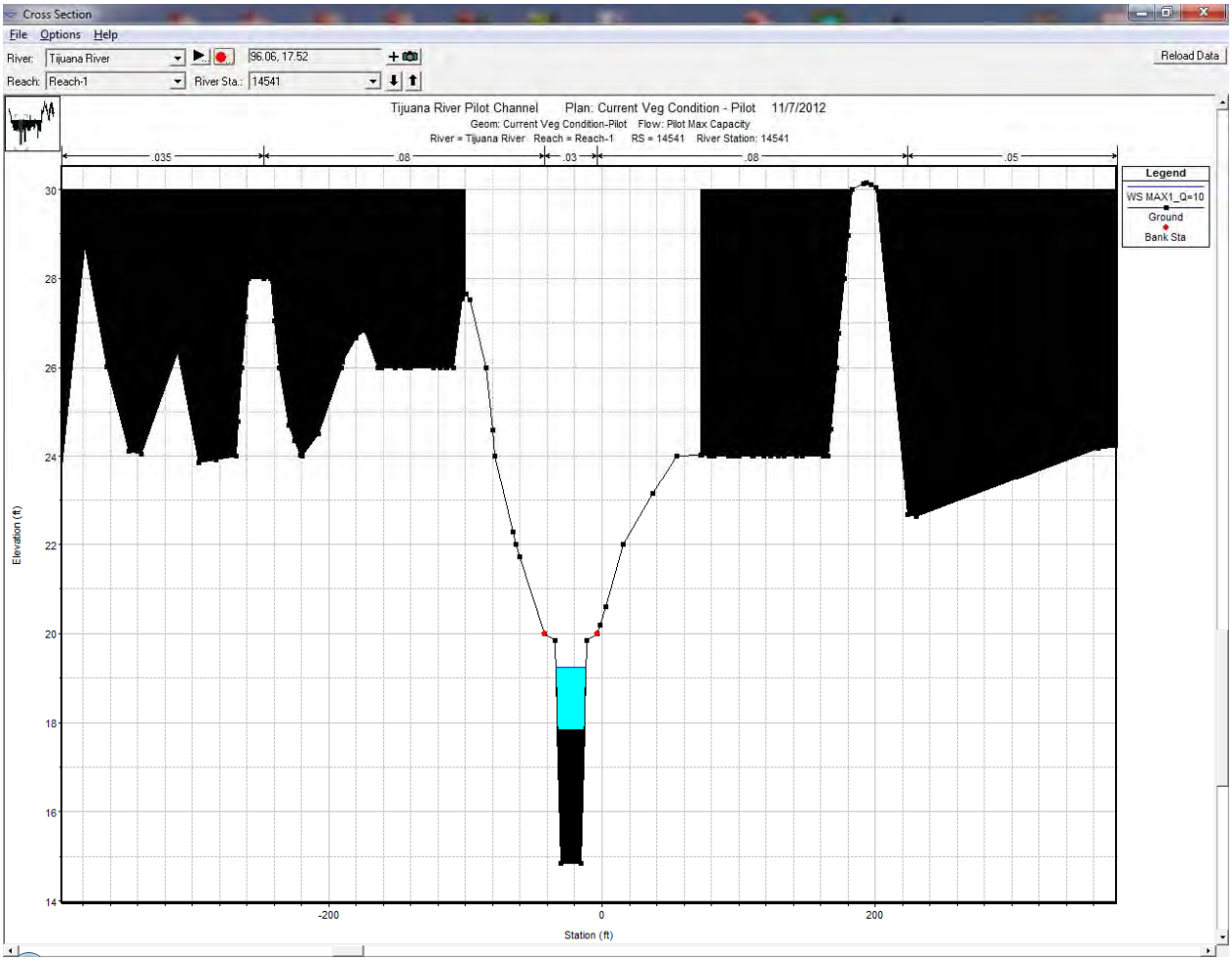

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 15501
562.82, 27.68
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 15501 River Station: 15501
.035
.08
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

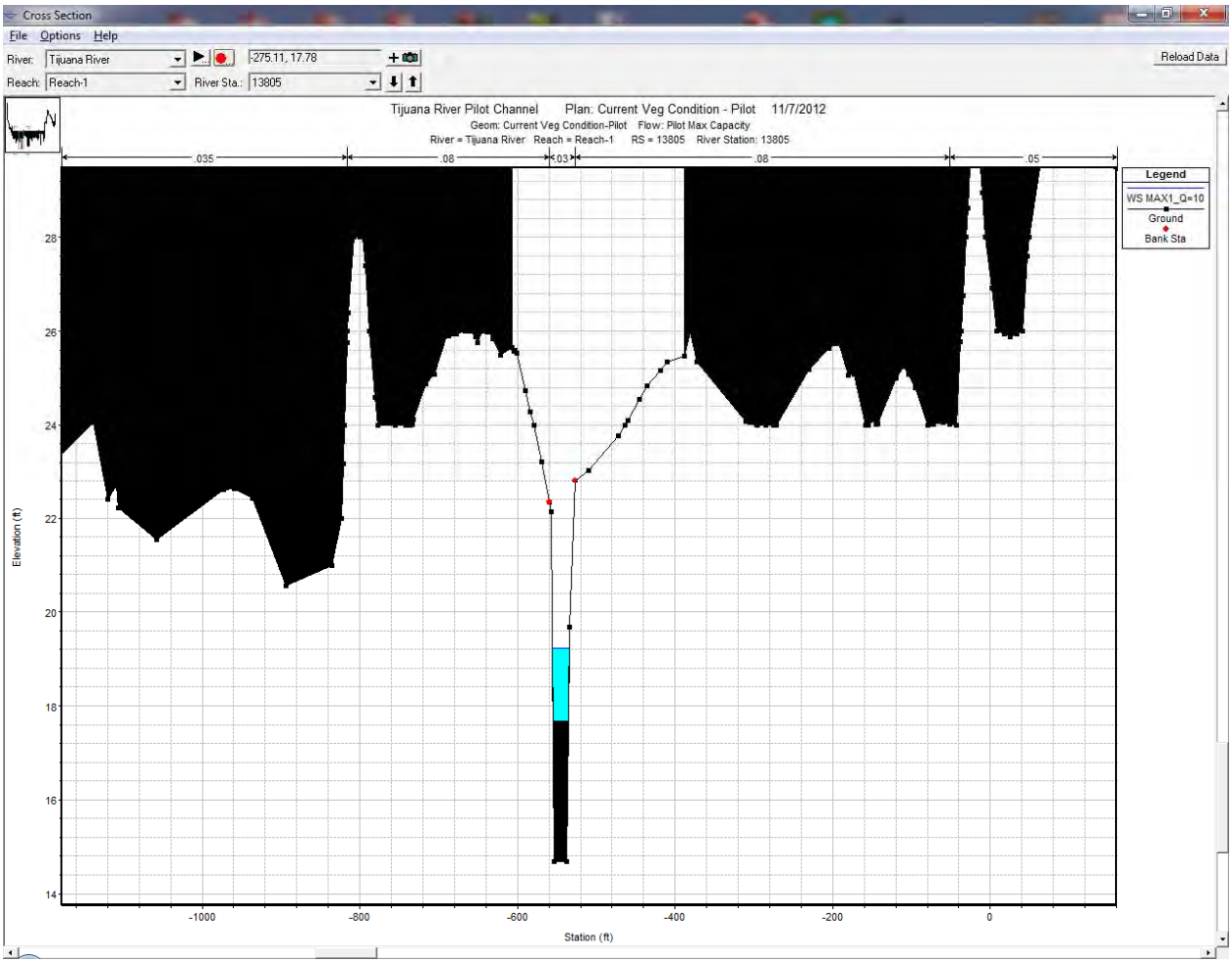

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14999
233.94, 16.72
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14999 XSECTION AT U/S END OF PILOT CHANNEL
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

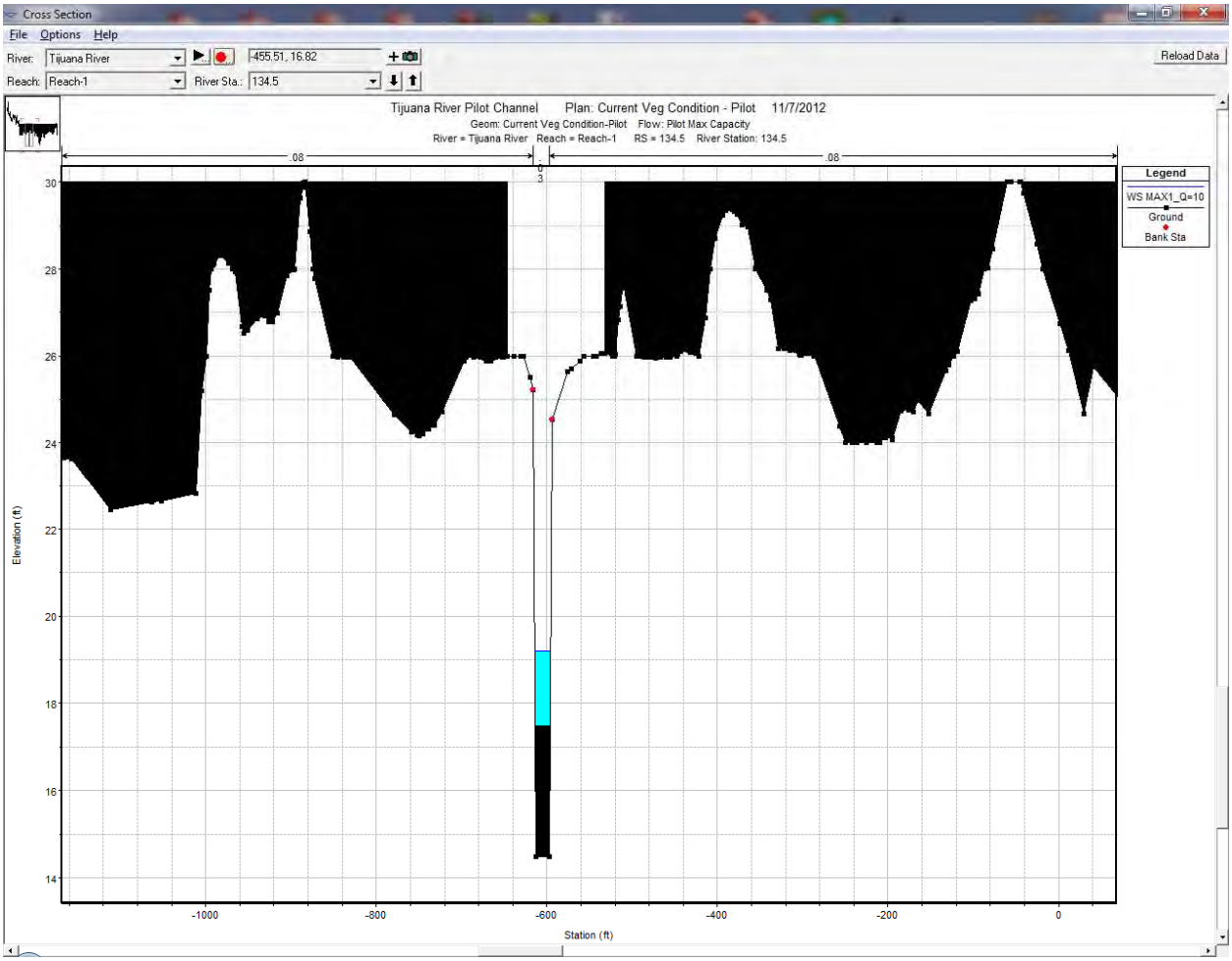

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14856 BR U
481.96, 21.86
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.08
.07
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

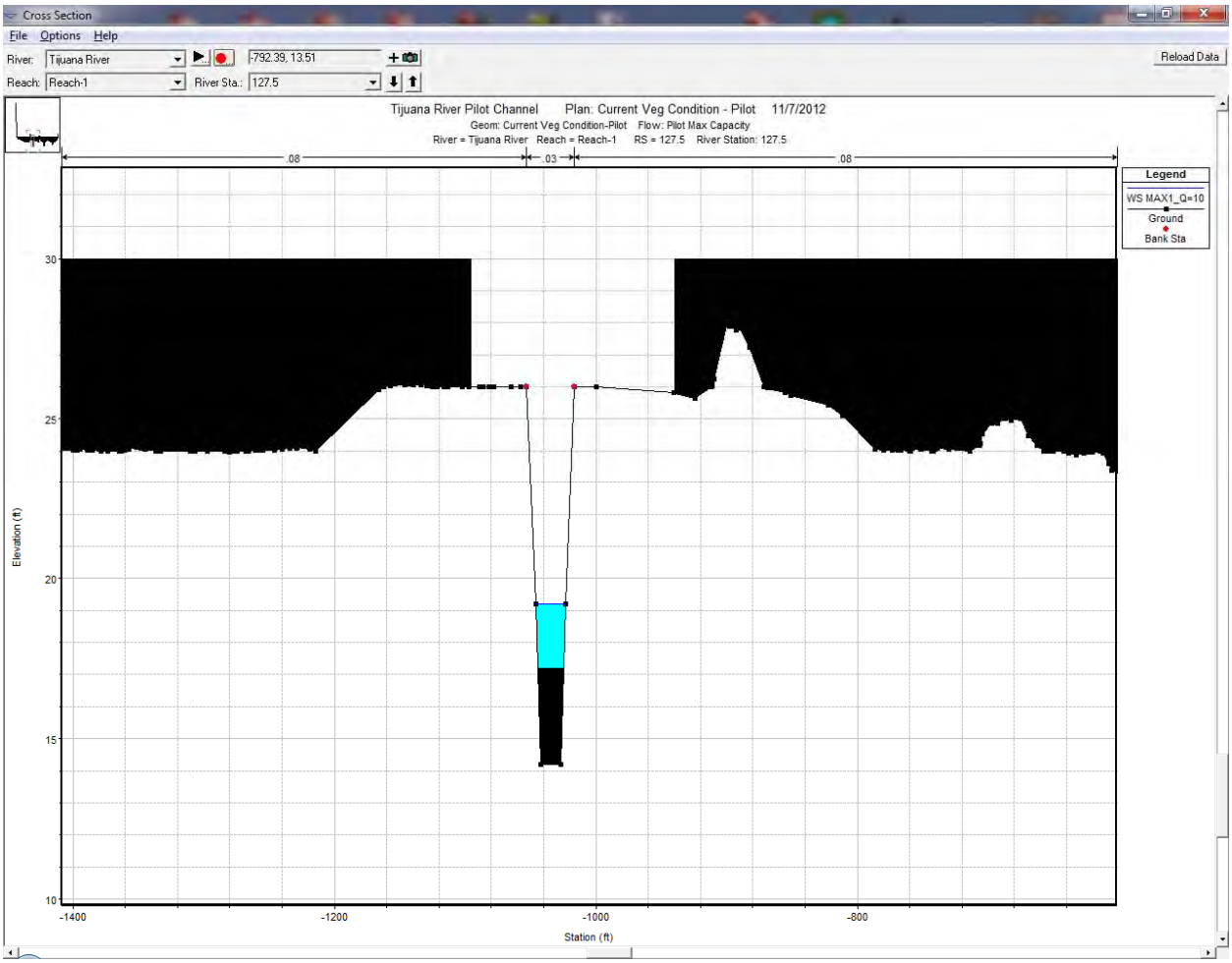

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14856 BR D
279.30, 21.48
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.08
.05
.05
.07
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

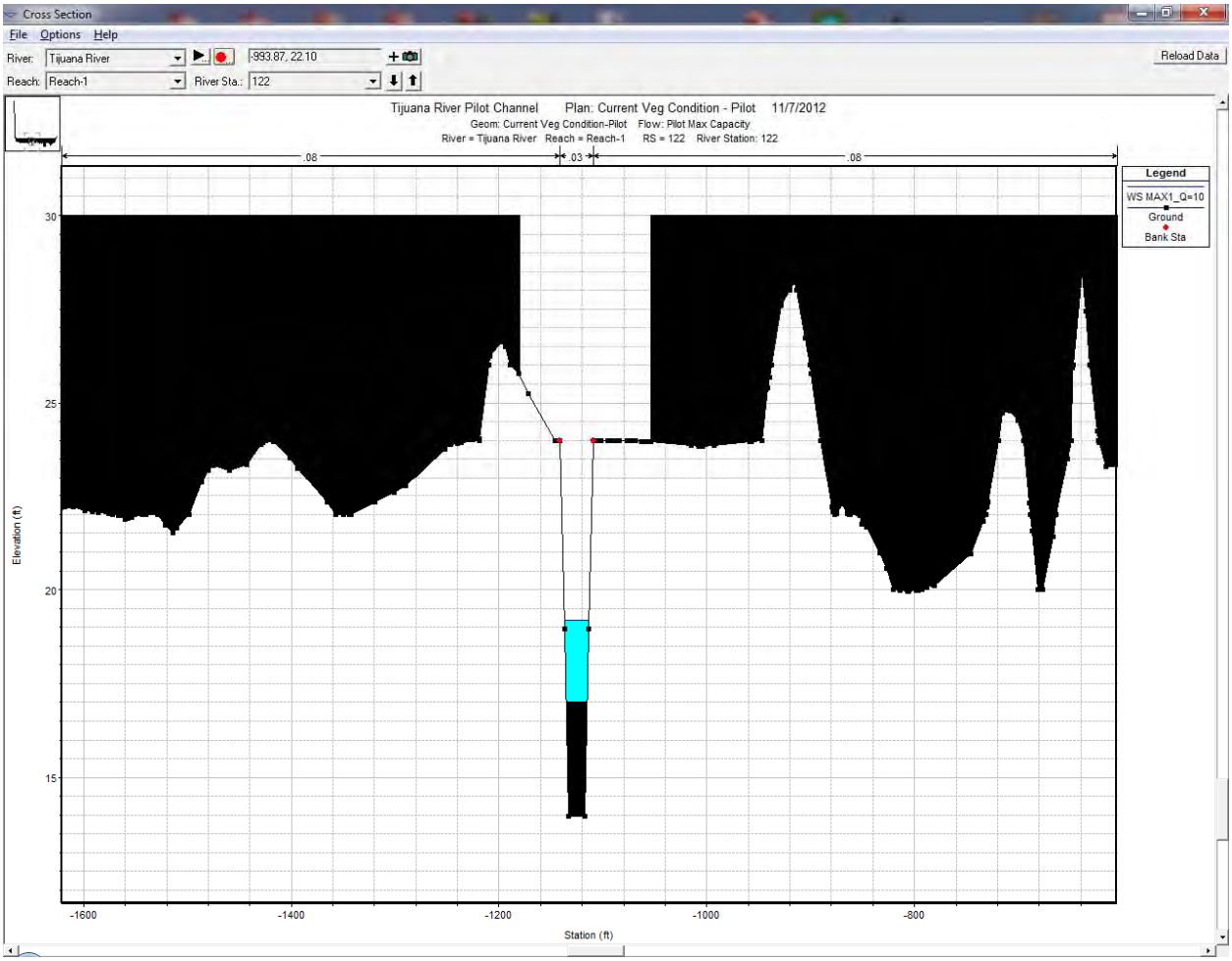

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14688
223.52, 17.63
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14688 River Station: 14688
.07
.035
.08
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

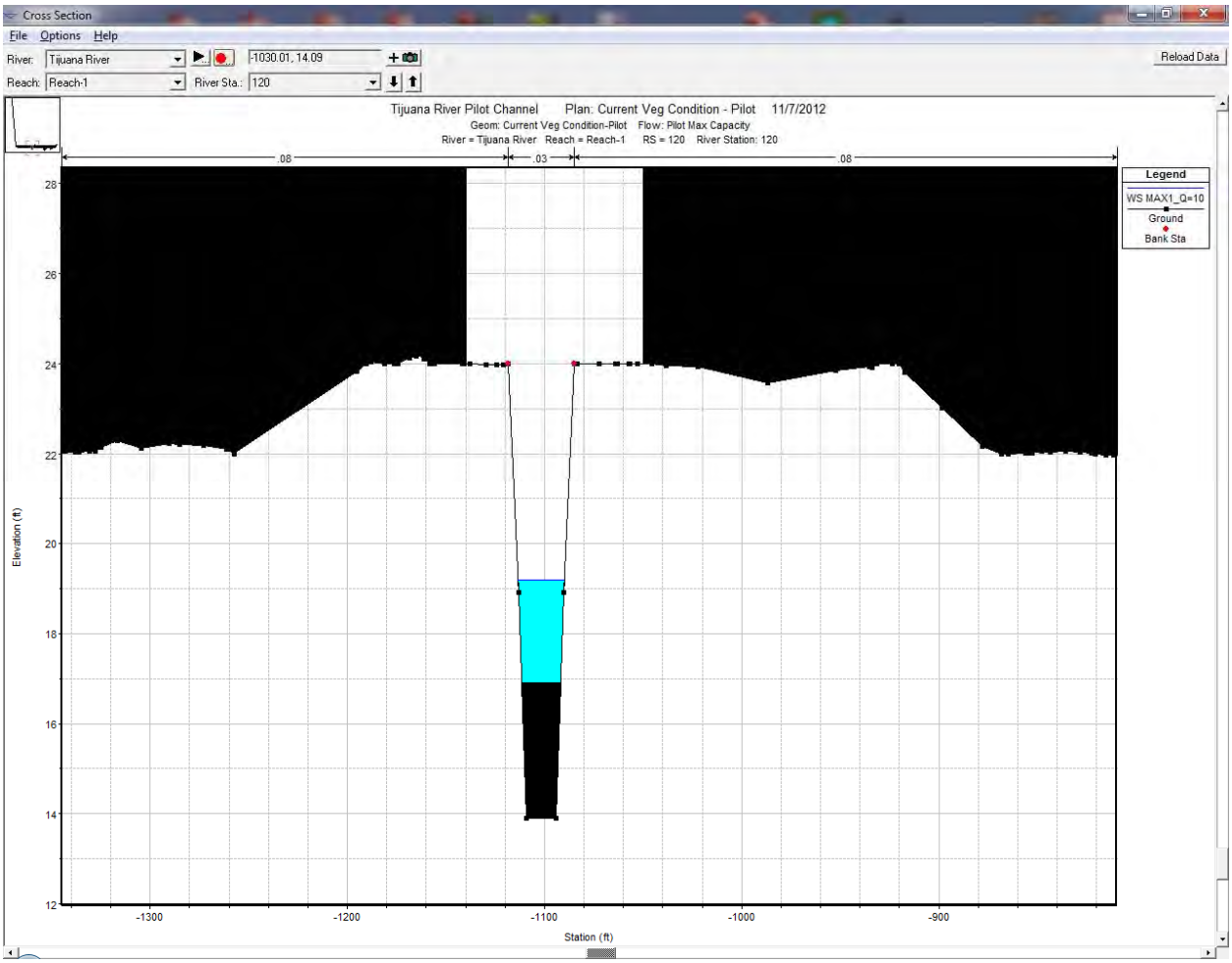

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14541
96.06, 17.52
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14541 River Station: 14541
.035
.08
.03
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

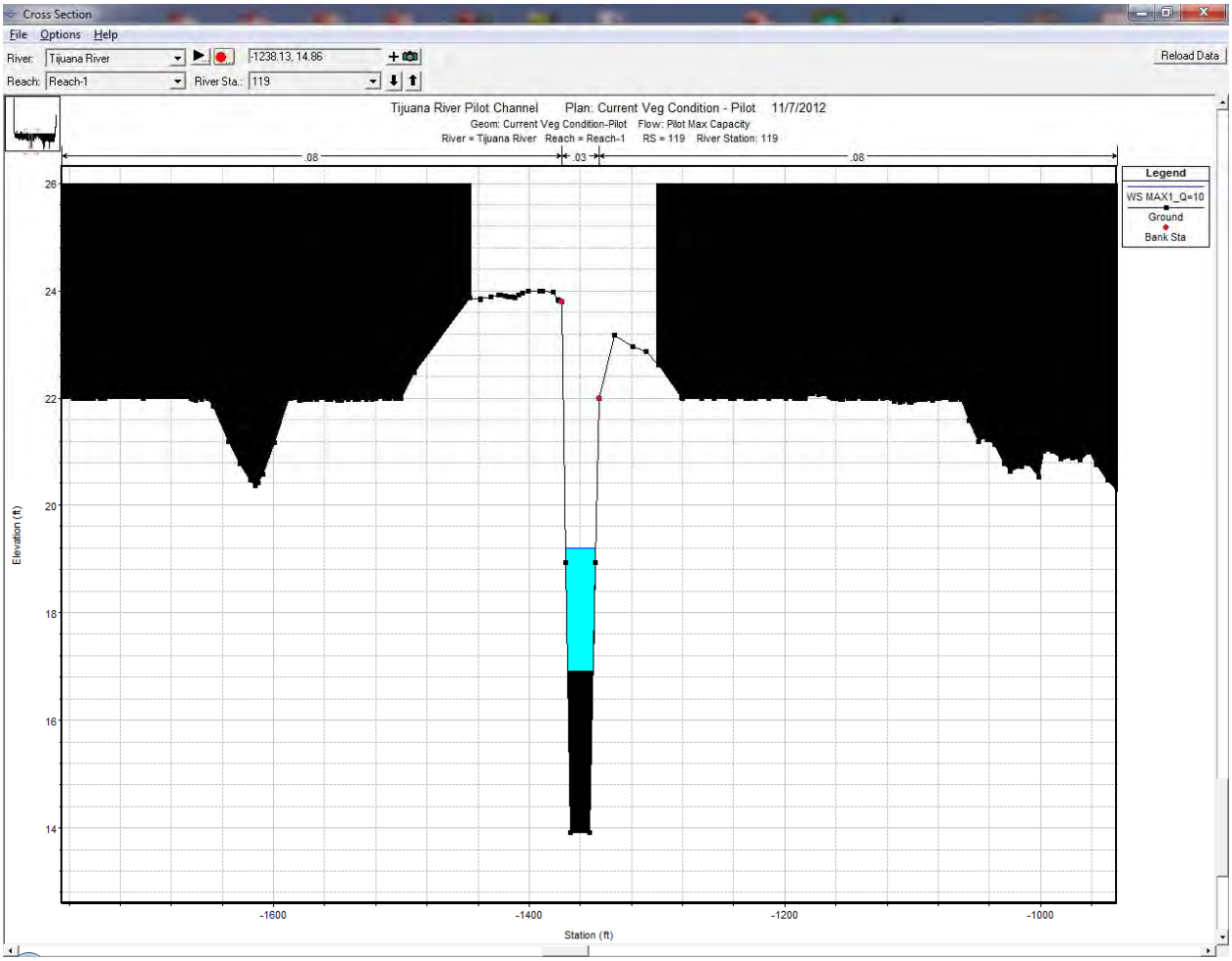

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-275.11, 17.78
River Sta.: 13805
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 13805 River Station: 13805
.035
.08
.03
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

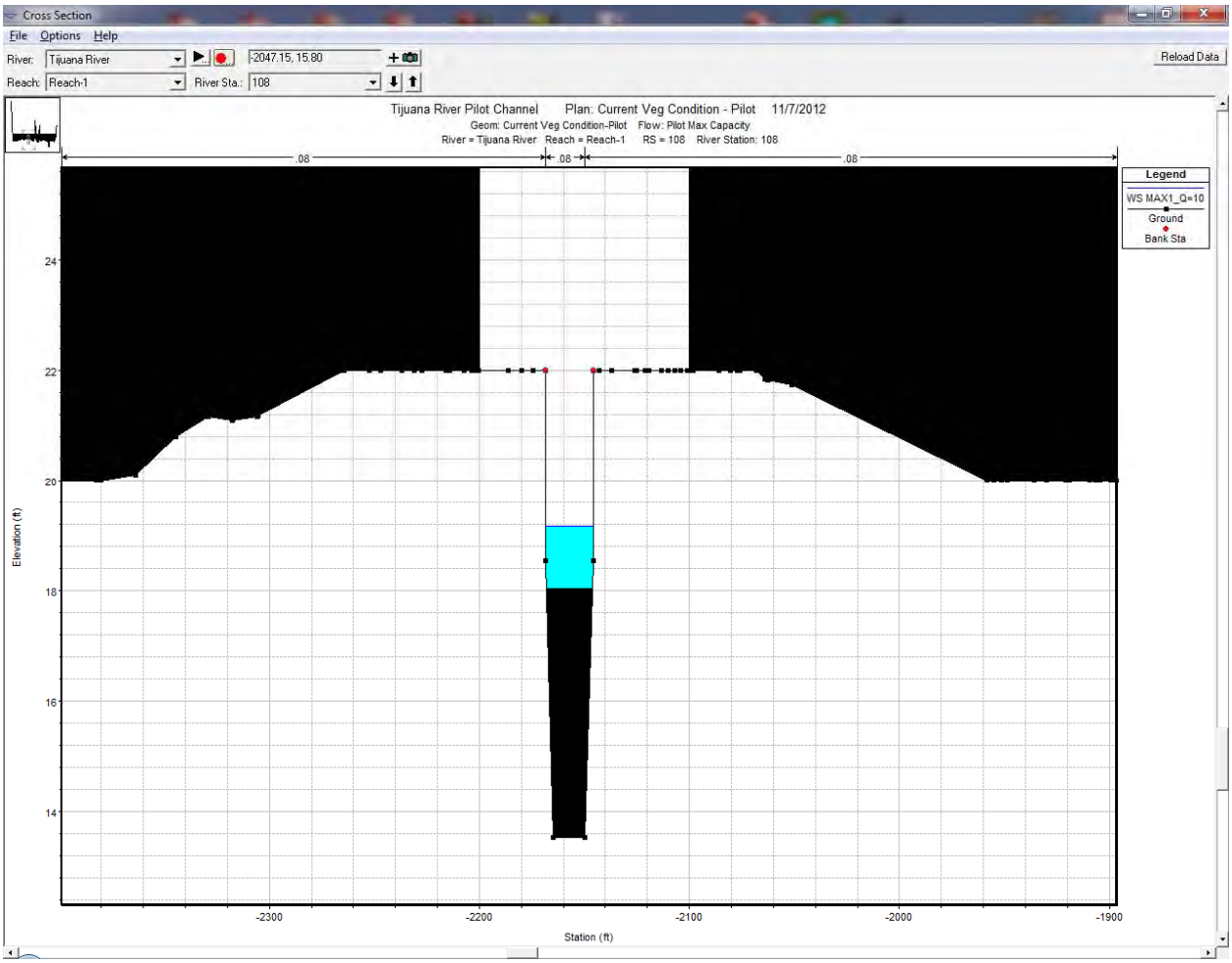

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-455.51, 16.82
River Sta.: 134.5
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 134.5 River Station: 134.5
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 127.5
-792.39, 13.51
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 127.5 River Station: 127.5
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
30
25
20
15
10
-1400
-1200
-1000
-800
Station (ft)

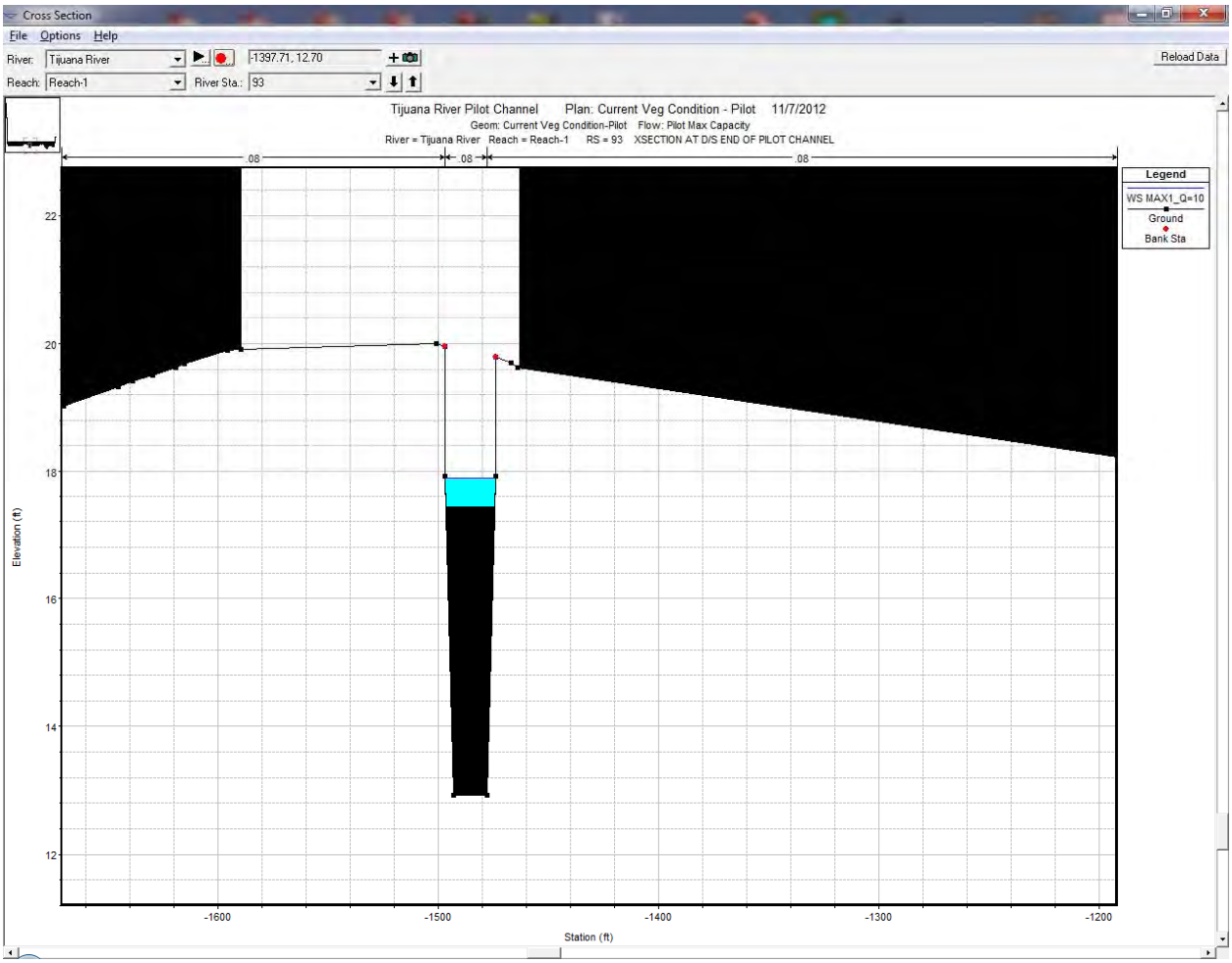

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 122
-993.87, 22.10
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 122 River Station: 122
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
30
25
20
15
-1600
-1400
-1200
-1000
-800
Station (ft)

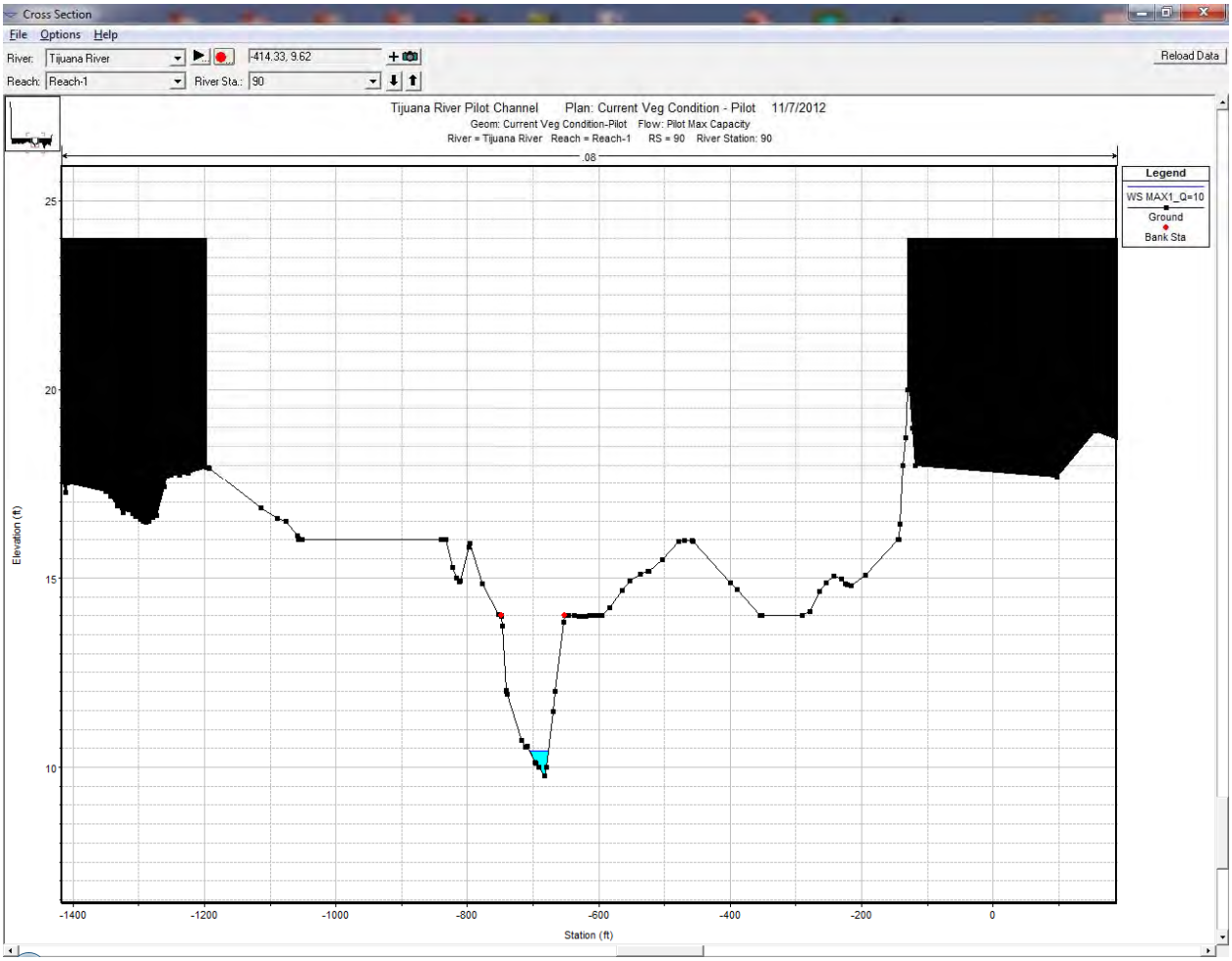

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 120
-1030.01, 14.09
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 120 River Station: 120
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

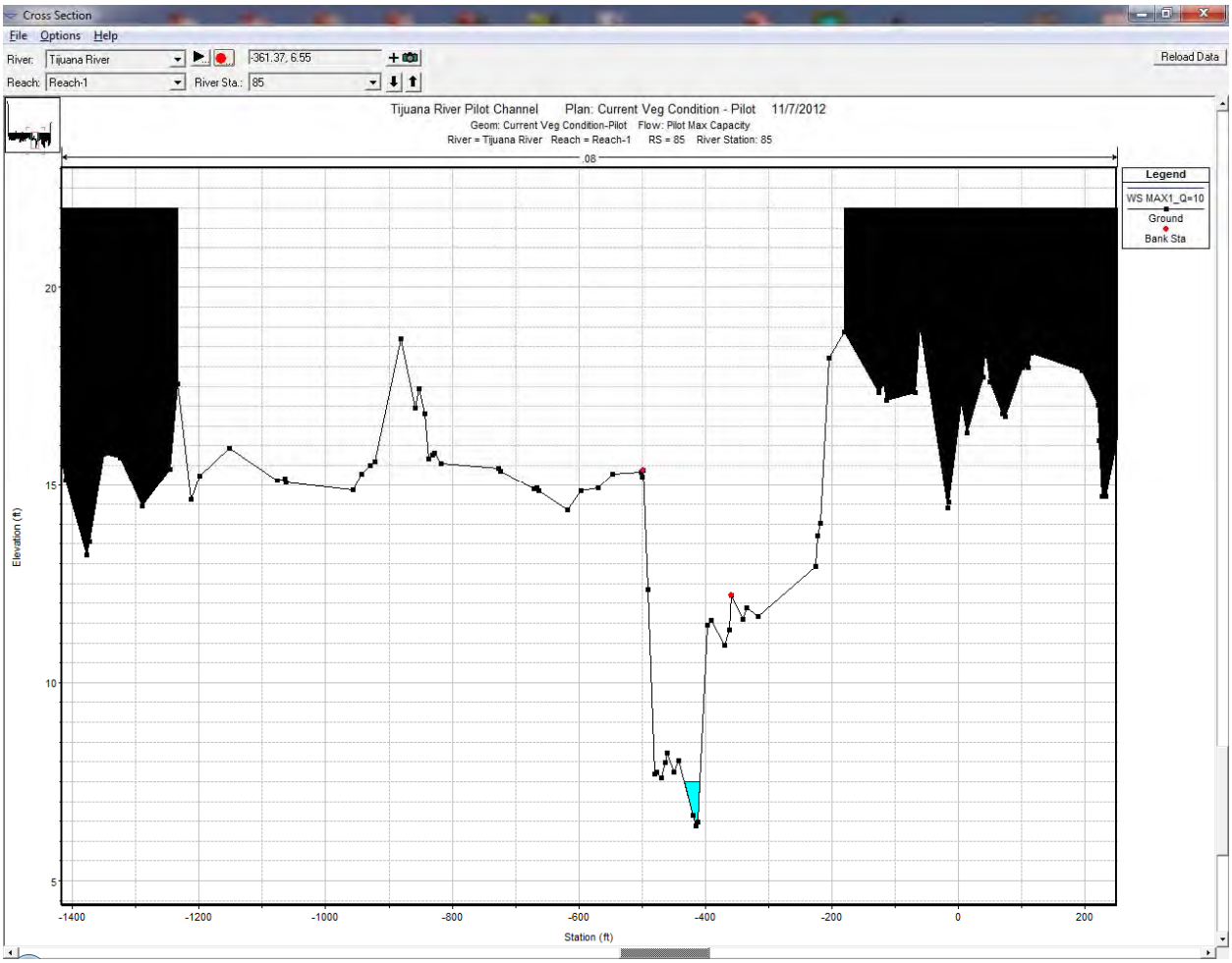

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 119
-1238.13, 14.86
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 119 River Station: 119
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

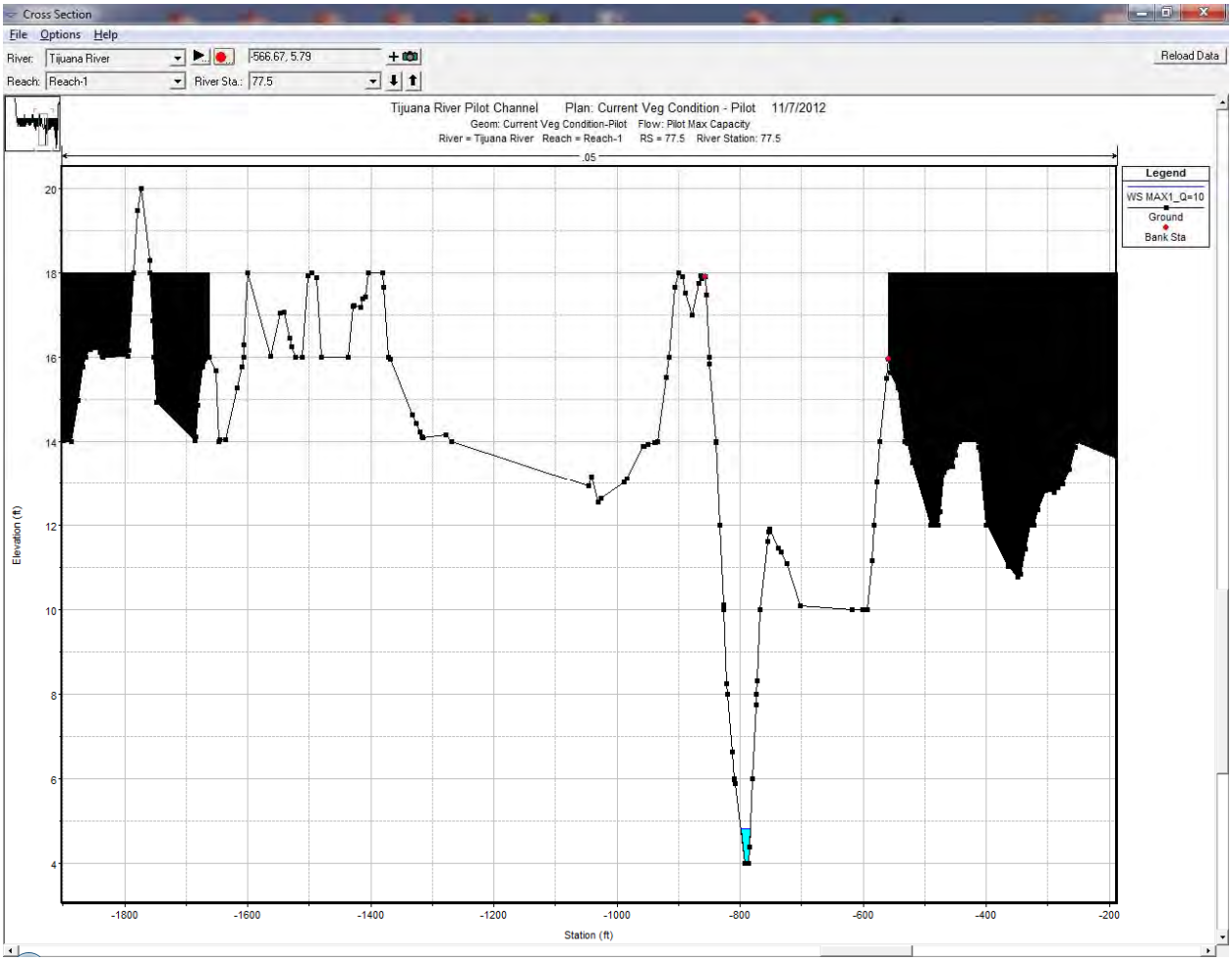

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-2047.15, 15.80
River Sta.: 108
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 108 River Station: 108
.08
.08
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
24
22
20
18
16
14
-2300
-2200
-2100
-2000
-1900
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-1596.20, 12.70
River Sta.: 97.5
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 97.5 River Station: 97.5
.08
.08
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
24
22
20
18
16
14
12
-1900
-1800
-1700
-1600
-1500
-1400
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 93
-1397.71, 12.70
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 93 XSECTION AT D/S END OF PILOT CHANNEL
.08
.08
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

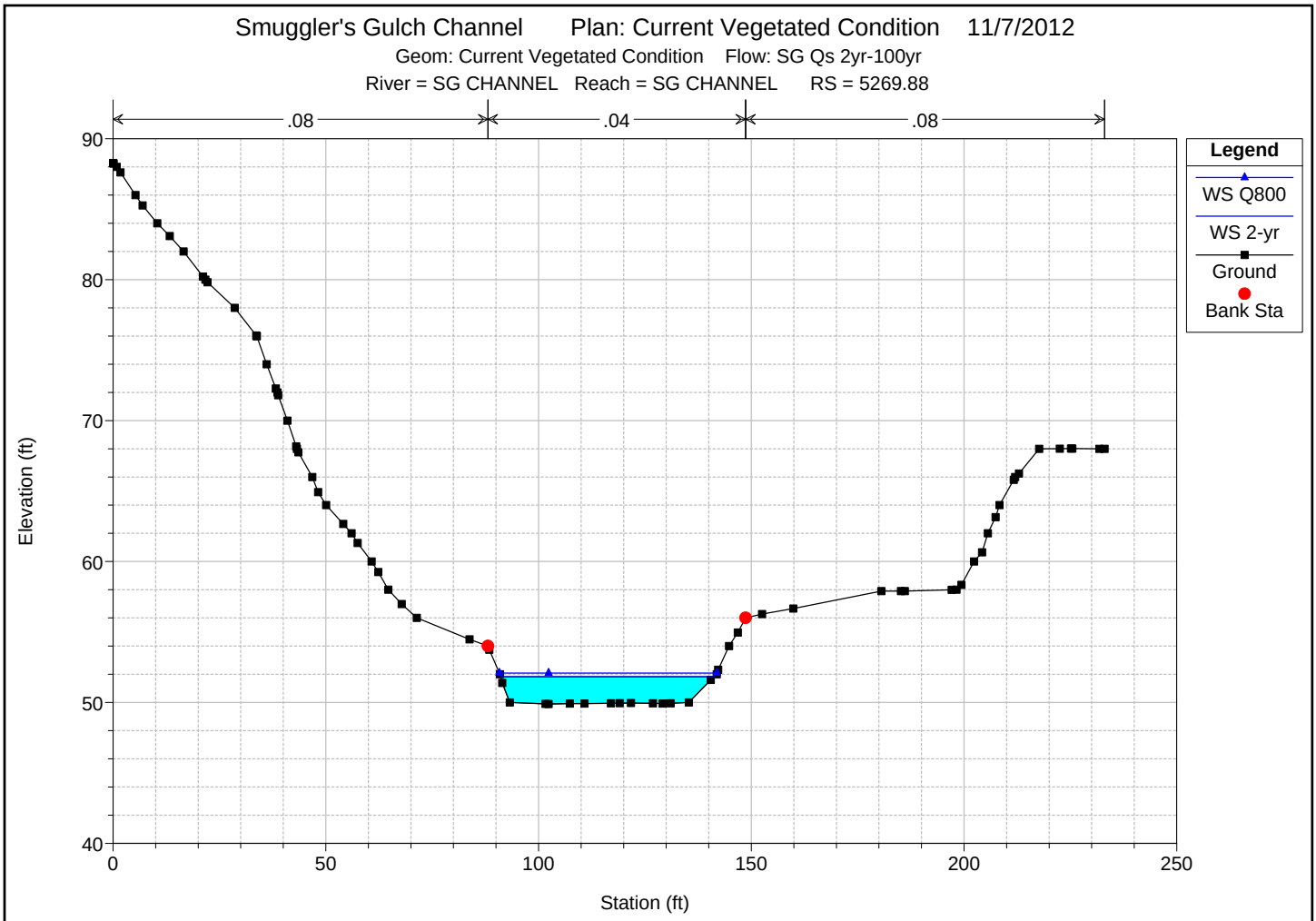

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 90
-414.33, 9.62
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 90 River Station: 90
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

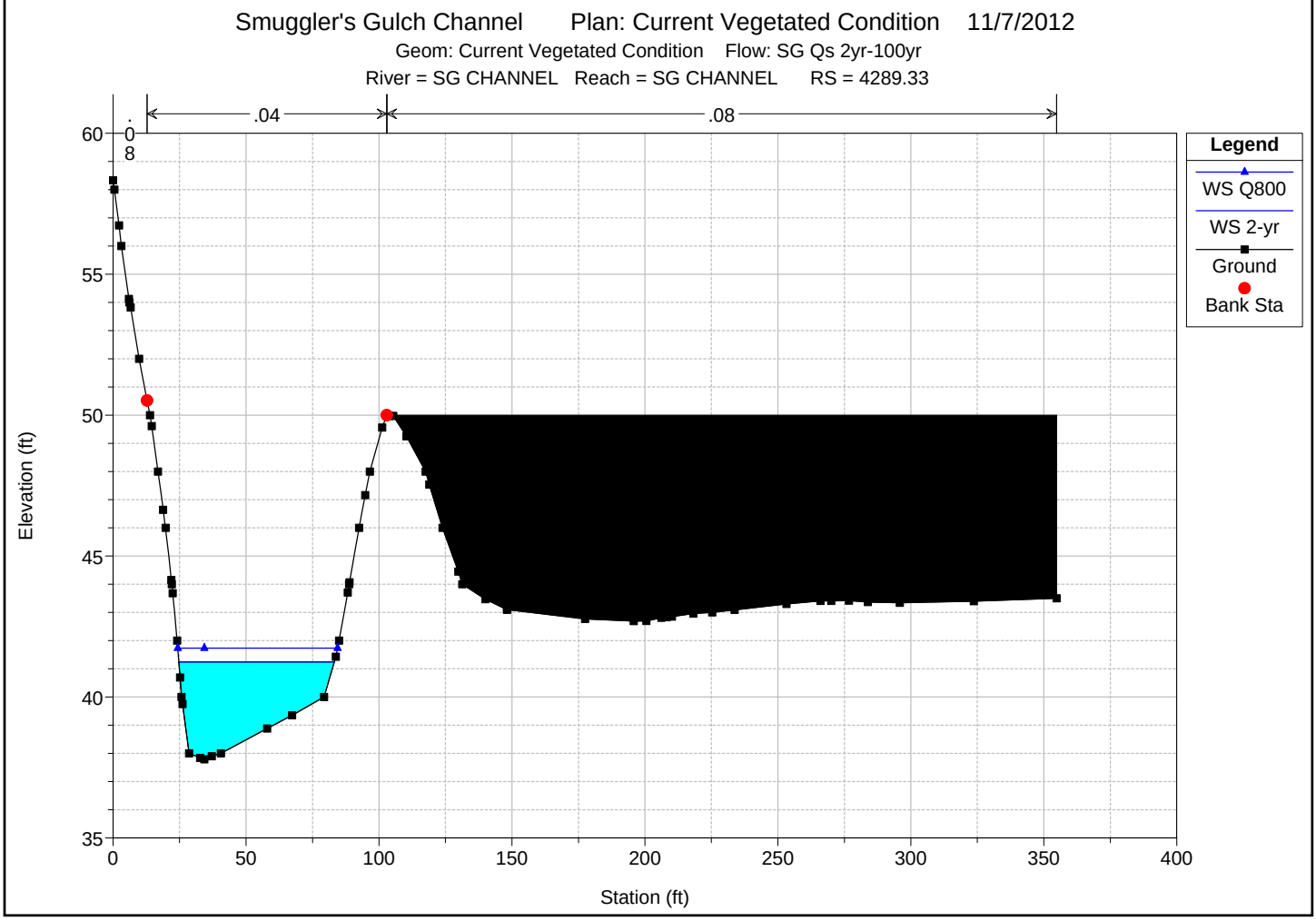

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 85
-361.37, 6.55
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 85 River Station: 85
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

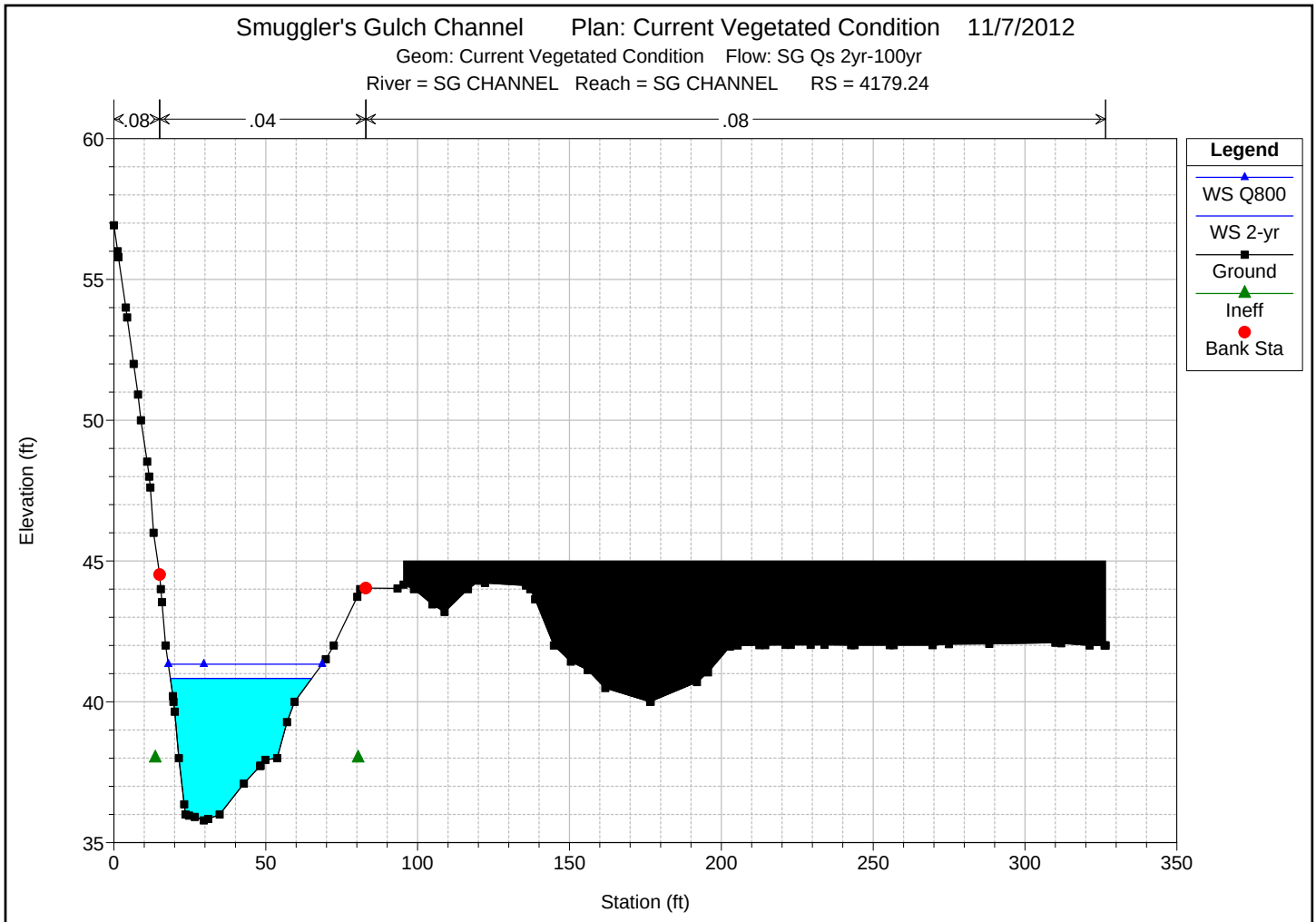

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 77.5
-566.67, 5.79
Reload Data
Tijuana River Pilot Channel Plan: Current Veg Condition - Pilot 11/7/2012
Geom: Current Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 77.5 River Station: 77.5
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

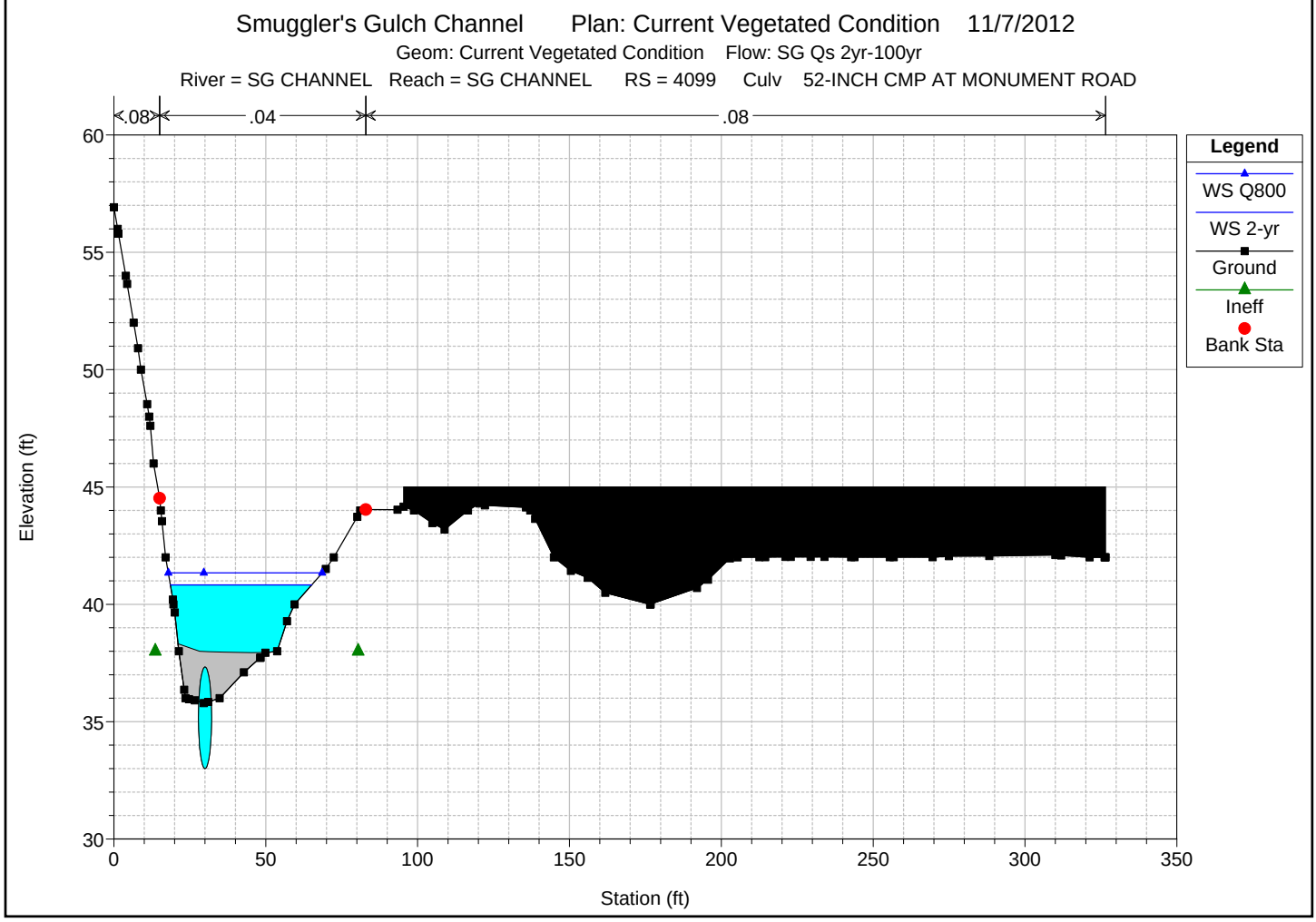
HEC-RAS Plan: CurrentVegeCndtn River: SG CHANNEL Reach: SG CHANNEL

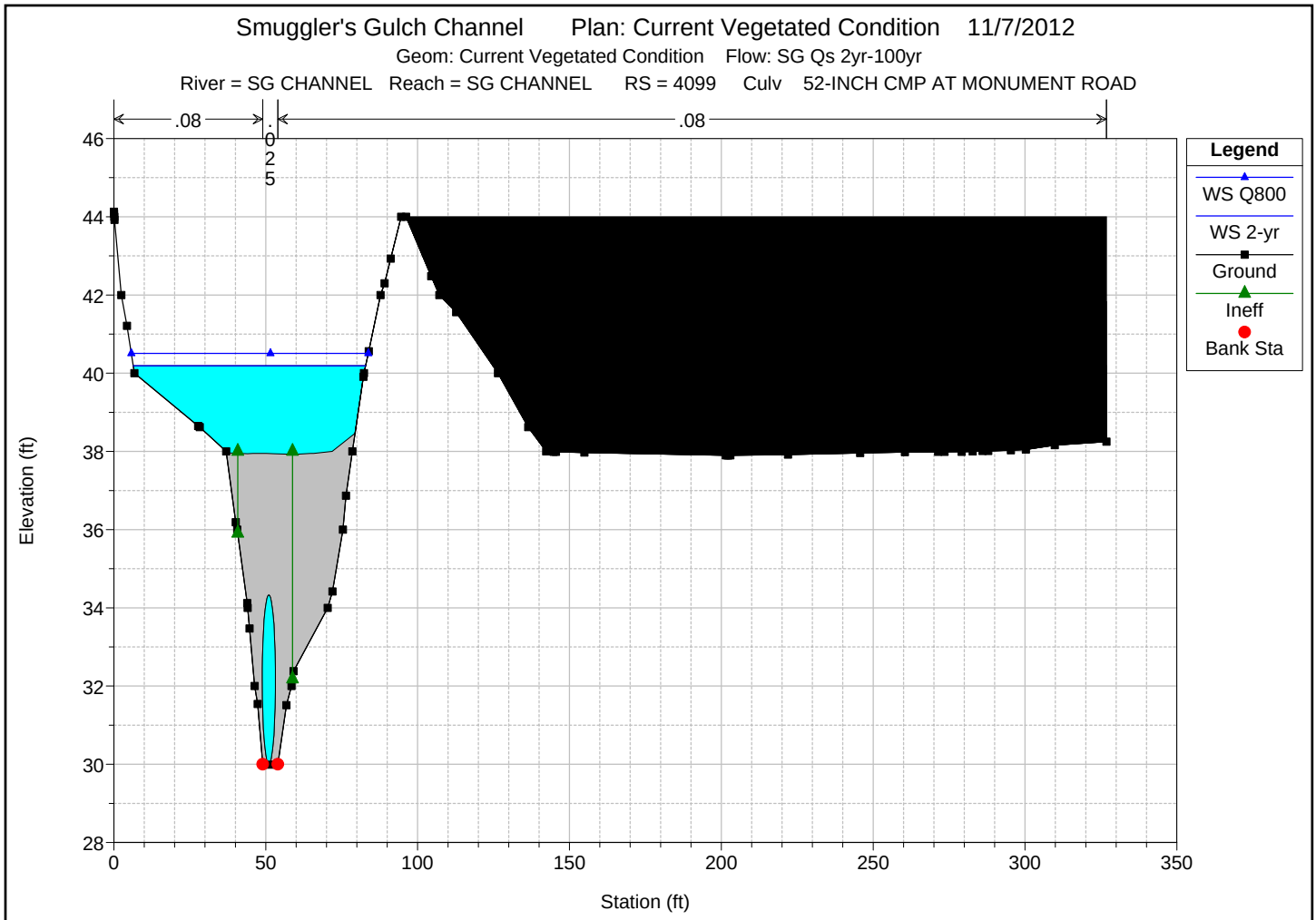
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
SG CHANNEL	5269.88	2-yr	653.00	49.89	51.83	51.83	52.70	0.020181	7.51	86.90	50.20	1.01
SG CHANNEL	5269.88	Q800	800.00	49.89	52.09	52.09	53.08	0.019437	7.99	100.15	51.18	1.01
SG CHANNEL	4289.33	2-yr	653.00	37.79	41.24	40.40	41.60	0.005462	4.76	137.06	58.48	0.55
SG CHANNEL	4289.33	Q800	800.00	37.79	41.73	40.65	42.09	0.004507	4.82	166.12	60.10	0.51
SG CHANNEL	4179.24	2-yr	653.00	35.79	40.83	39.08	41.13	0.003198	4.40	148.52	46.53	0.43
SG CHANNEL	4179.24	Q800	800.00	35.79	41.34	39.42	41.67	0.003219	4.62	173.24	50.68	0.44
SG CHANNEL	4099		Culvert									
SG CHANNEL	4028.11	2-yr	653.00	29.99	36.62	36.62	39.11	0.004857	14.60	87.39	36.72	1.00
SG CHANNEL	4028.11	Q800	800.00	29.99	37.36	37.36	40.19	0.004875	15.71	100.85	39.24	1.02
SG CHANNEL	4011.72	2-yr	653.00	29.98	31.39	32.91	37.75	0.074774	20.40	34.55	26.70	3.03
SG CHANNEL	4011.72	Q800	800.00	29.98	31.61	33.33	38.71	0.069101	21.59	40.42	27.24	2.99
SG CHANNEL	3863.17	2-yr	653.00	29.87	33.50	31.95	33.81	0.001058	4.51	157.54	48.66	0.42
SG CHANNEL	3863.17	Q800	800.00	29.87	34.91	32.24	35.15	0.000515	3.93	230.09	55.49	0.31
SG CHANNEL	3774.45	2-yr	653.00	29.80	33.15	32.13	33.67	0.001959	5.77	120.99	41.90	0.56
SG CHANNEL	3774.45	Q800	800.00	29.80	34.75	32.45	35.08	0.000761	4.69	193.89	52.11	0.38
SG CHANNEL	2623.27	2-yr	653.00	25.73	32.49	28.83	32.73	0.000389	4.14	235.58	50.93	0.28
SG CHANNEL	2623.27	Q800	800.00	25.73	34.38	29.24	34.58	0.000244	3.88	347.32	74.49	0.23
SG CHANNEL	2549.85	2-yr	653.00	24.00	32.53	27.34	32.68	0.000200	3.51	341.90	61.17	0.21
SG CHANNEL	2549.85	Q800	800.00	24.00	34.41	27.78	34.55	0.000143	3.39	465.80	70.26	0.18
SG CHANNEL	2500		Culvert									
SG CHANNEL	2489.75	2-yr	653.00	24.00	30.02	26.24	30.17	0.000257	3.15	229.67	50.34	0.23
SG CHANNEL	2489.75	Q800	800.00	24.00	30.55	26.57	30.74	0.000288	3.53	257.32	53.11	0.24
SG CHANNEL	2408.4	2-yr	653.00	25.74	29.38	28.52	30.07	0.002491	6.85	116.84	41.50	0.64
SG CHANNEL	2408.4	Q800	800.00	25.74	29.83	28.89	30.63	0.002450	7.37	136.36	43.90	0.65
SG CHANNEL	1551.01	2-yr	653.00	22.00	25.36	25.36	26.89	0.005730	10.10	78.79	32.45	0.97
SG CHANNEL	1551.01	Q800	800.00	22.00	25.85	25.85	27.54	0.005387	10.71	95.24	35.90	0.96

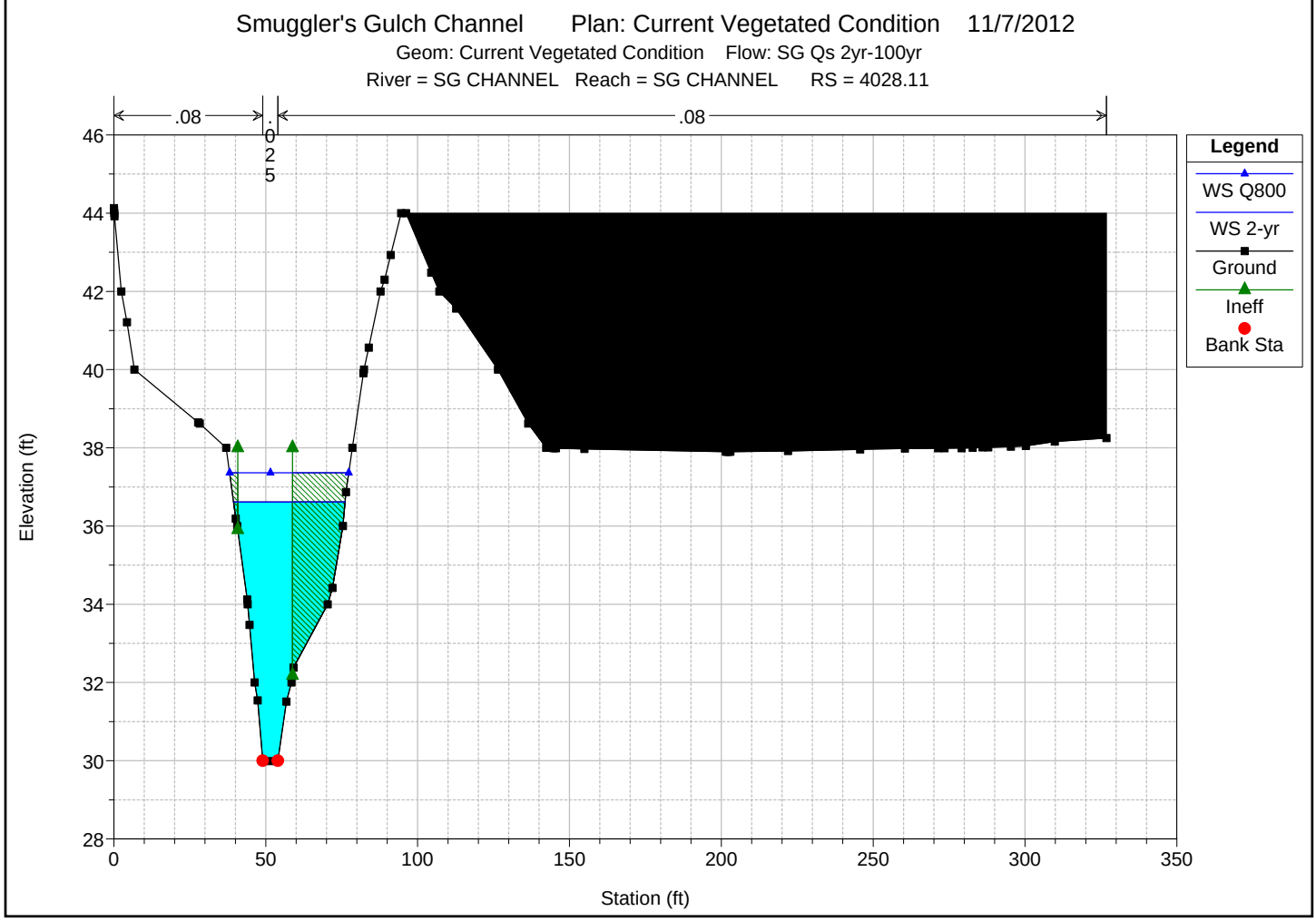

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 5269.88
.08
.04
.08
Legend
WS Q800
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
90
80
70
60
50
40
0
50
100
150
200
250

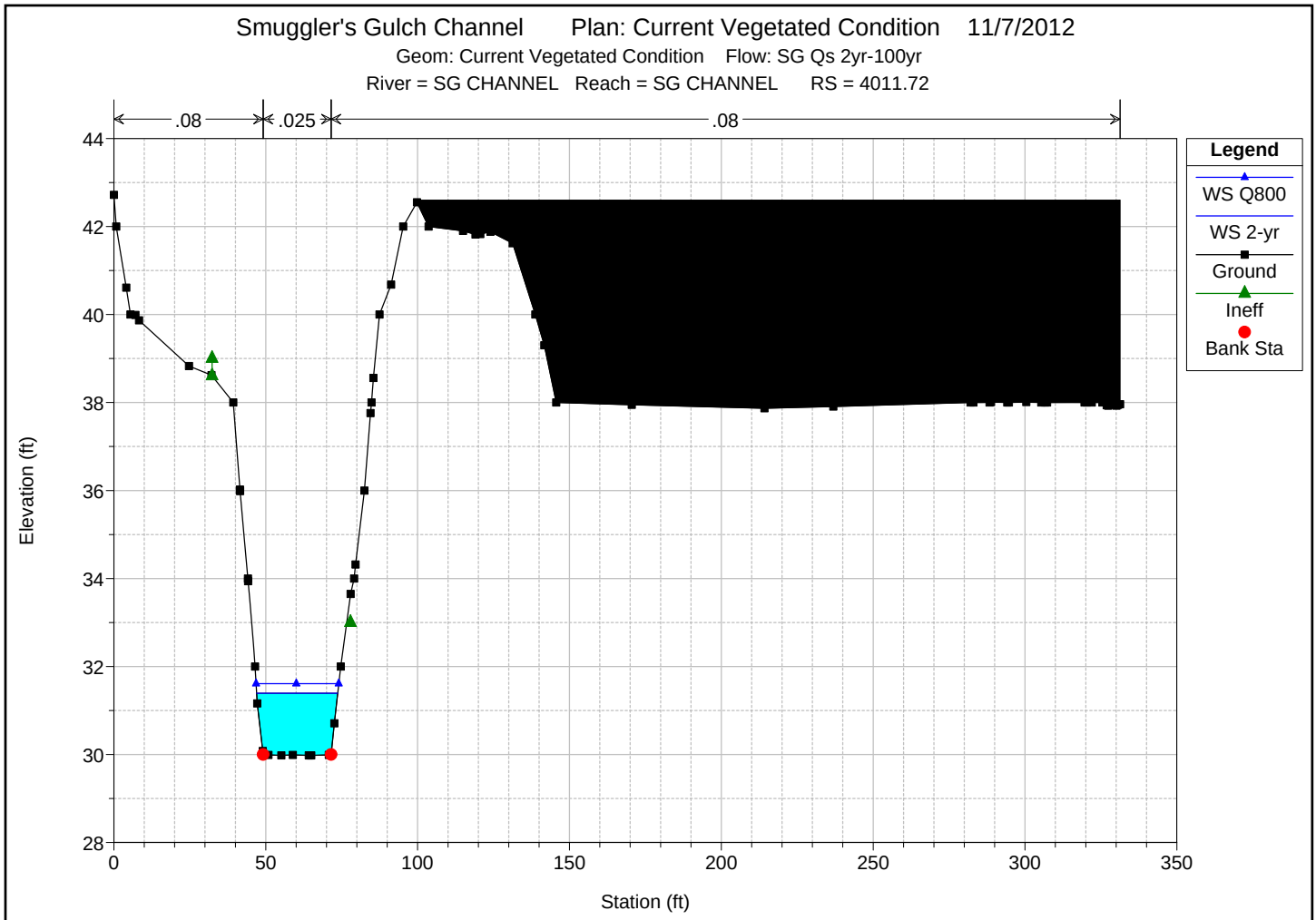

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4289.33
.04
.08
.08
Legend
WS Q800
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
55
50
45
40
35
0
50
100
150
200
250
300
350
400

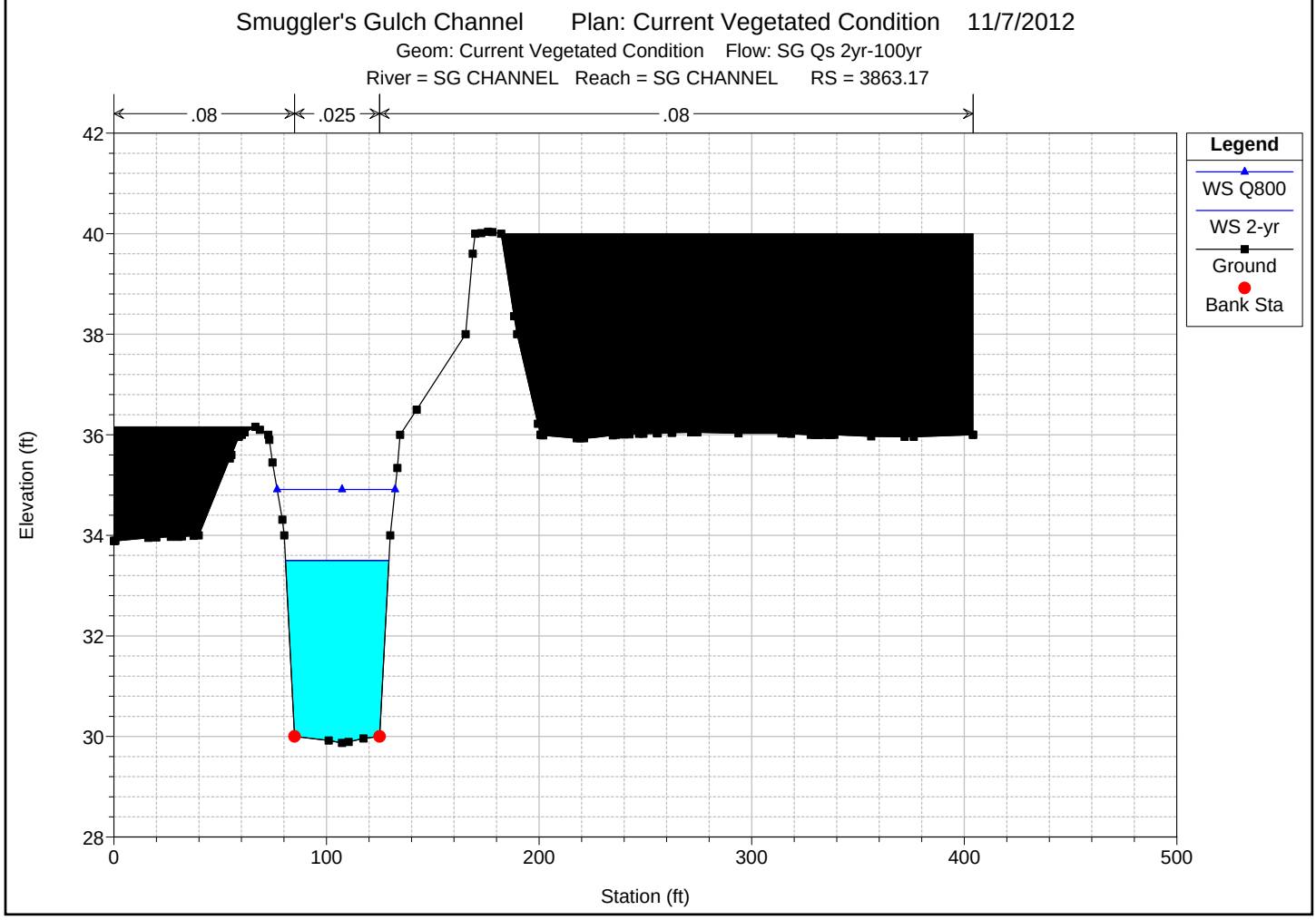

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4179.24
.08
.04
.08
Legend
WS Q800
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
60
55
50
45
40
35
0
50
100
150
200
250
300
350

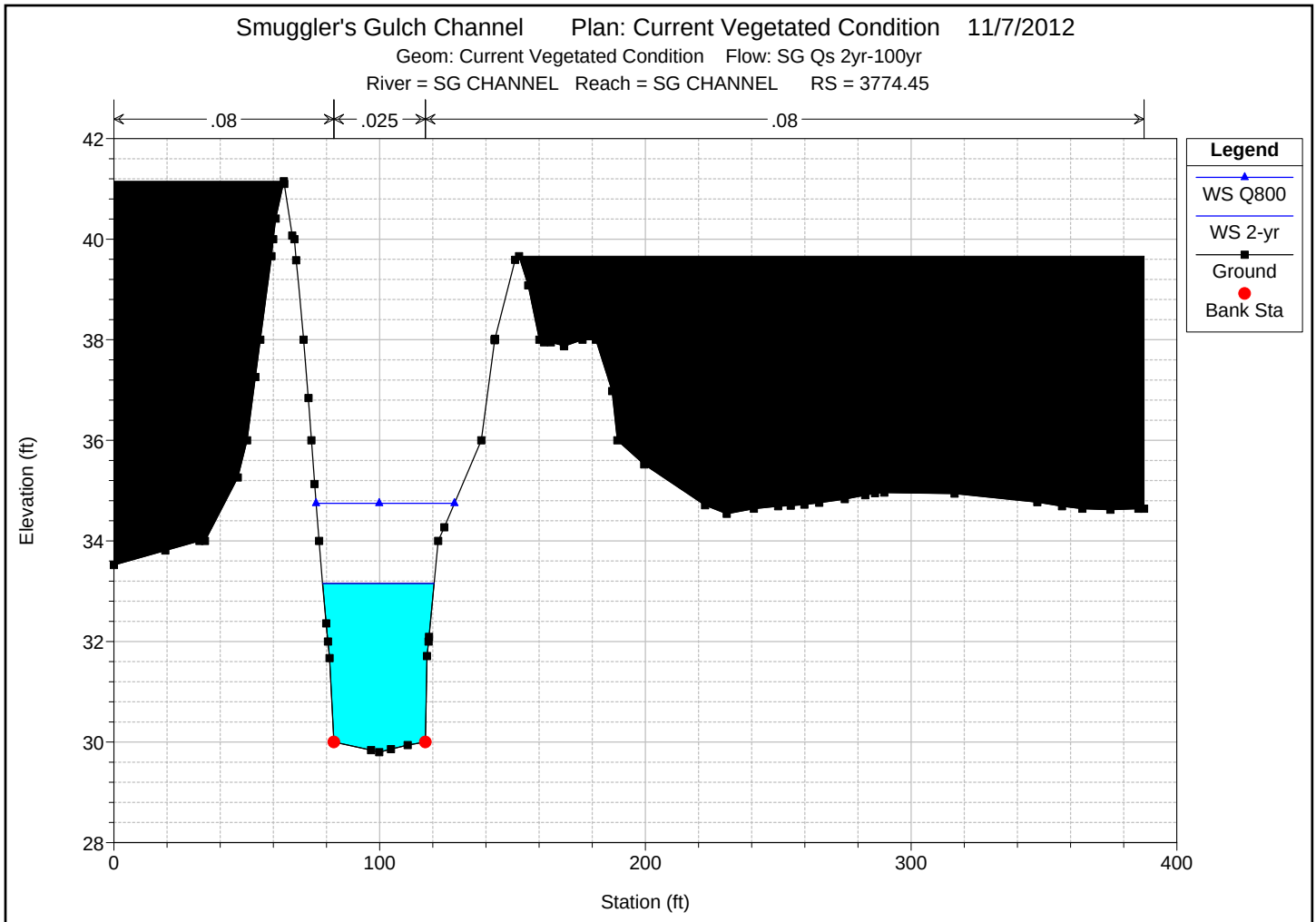

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4099 Culv 52-INCH CMP AT MONUMENT ROAD
.08
.04
.08
Legend
WS Q800
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
60
55
50
45
40
35
30
0
50
100
150
200
250
300
350

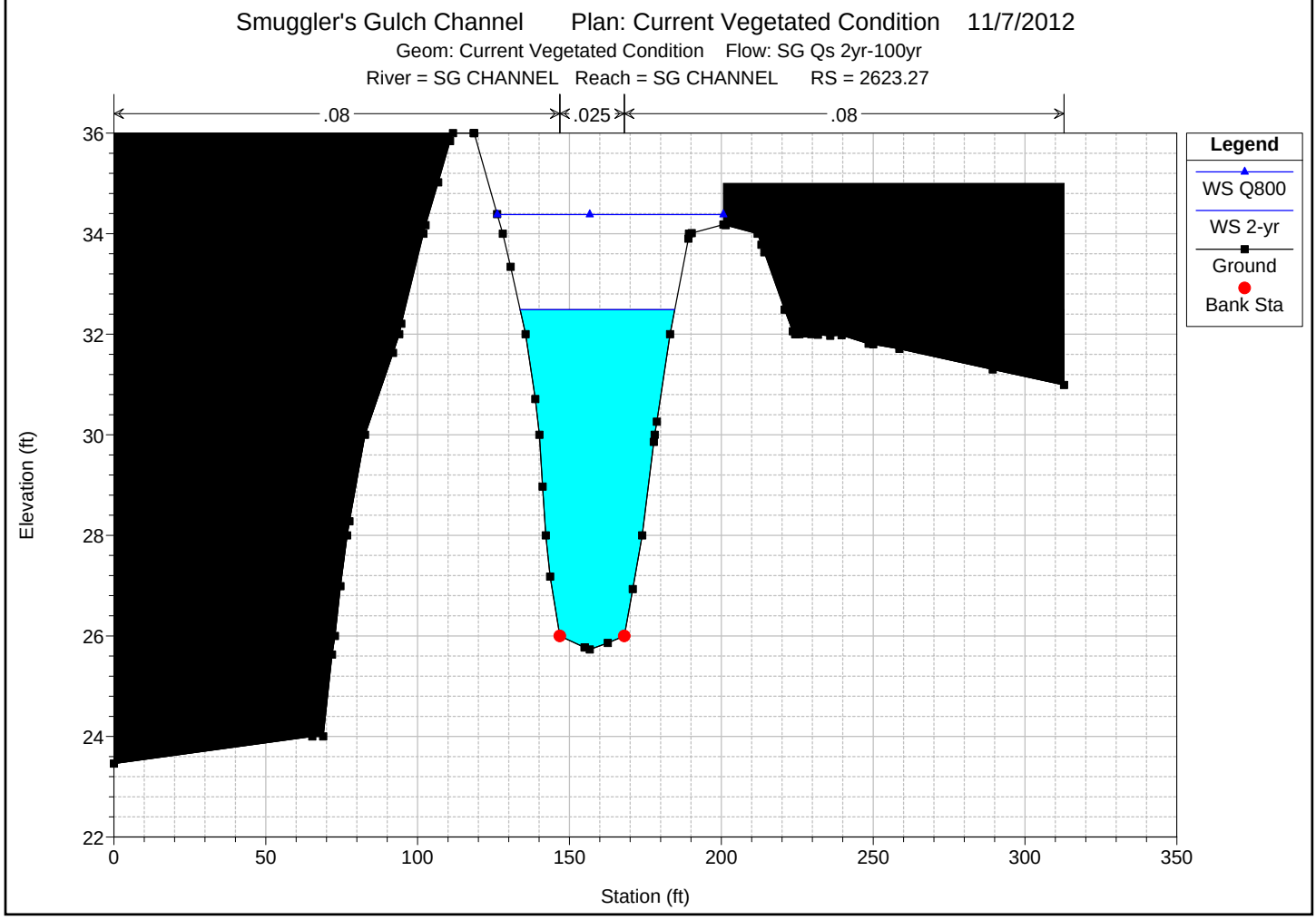

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4099 Culv 52-INCH CMP AT MONUMENT ROAD
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
46
0
50
100
150
200
250
300
350

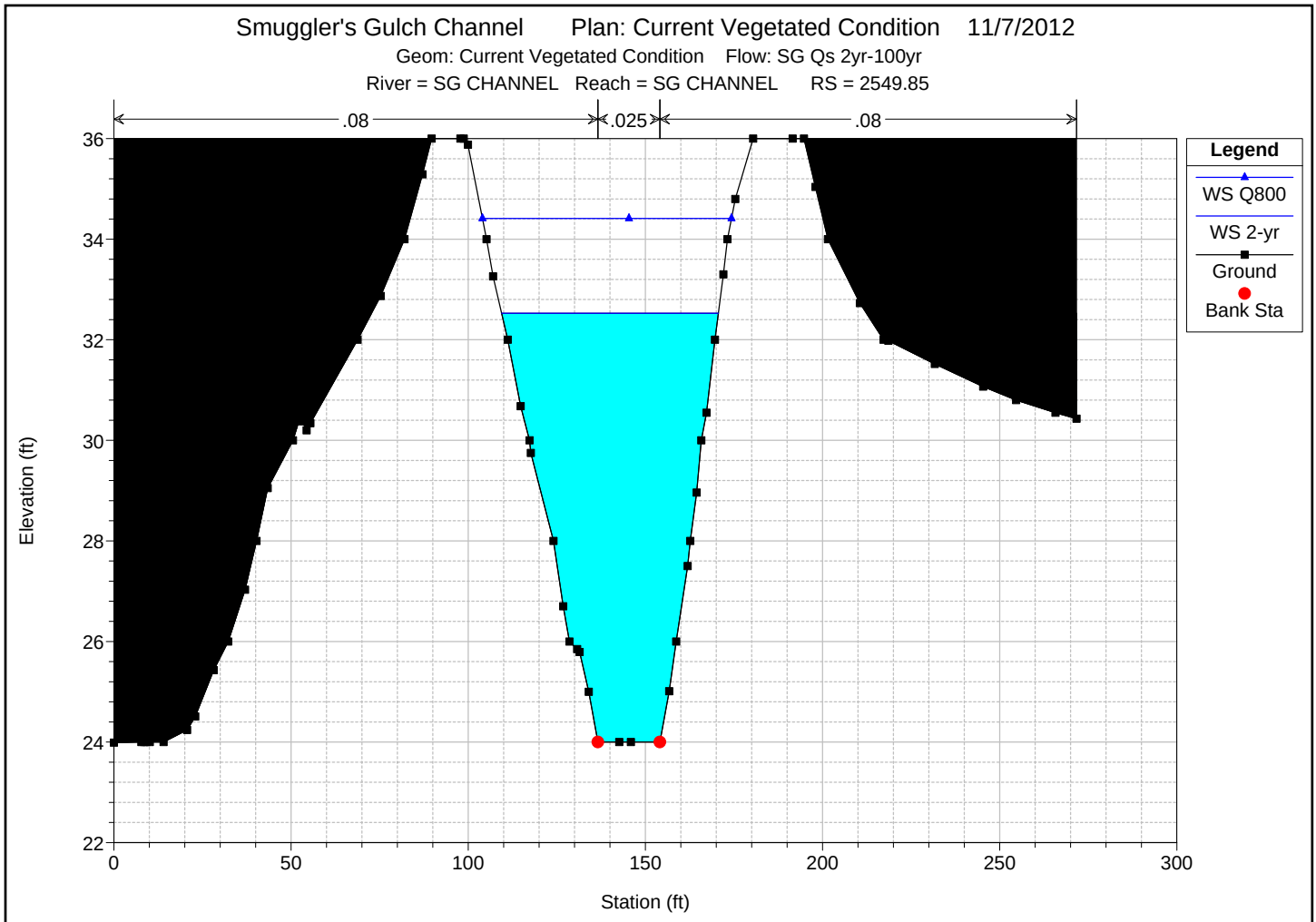

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4028.11
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
46
0
50
100
150
200
250
300
350

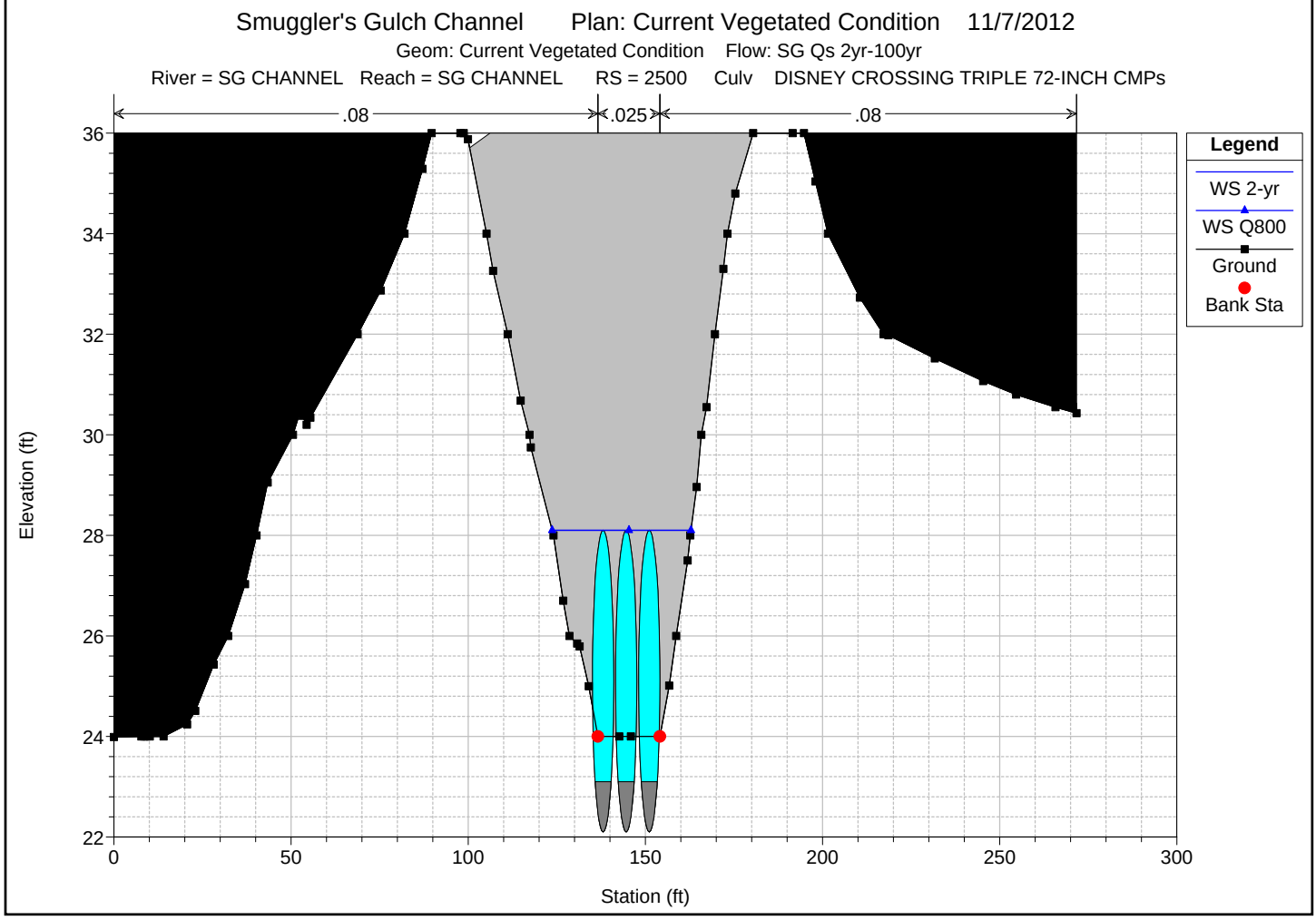

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4011.72
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
44
42
40
38
36
34
32
30
28
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 3863.17
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
42
40
38
36
34
32
30
28
0
100
200
300
400
500


Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 3774.45
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
42
40
38
36
34
32
30
28
0
100
200
300
400


Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 2623.27
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
36
34
32
30
28
26
24
22
0
50
100
150
200
250
300
350

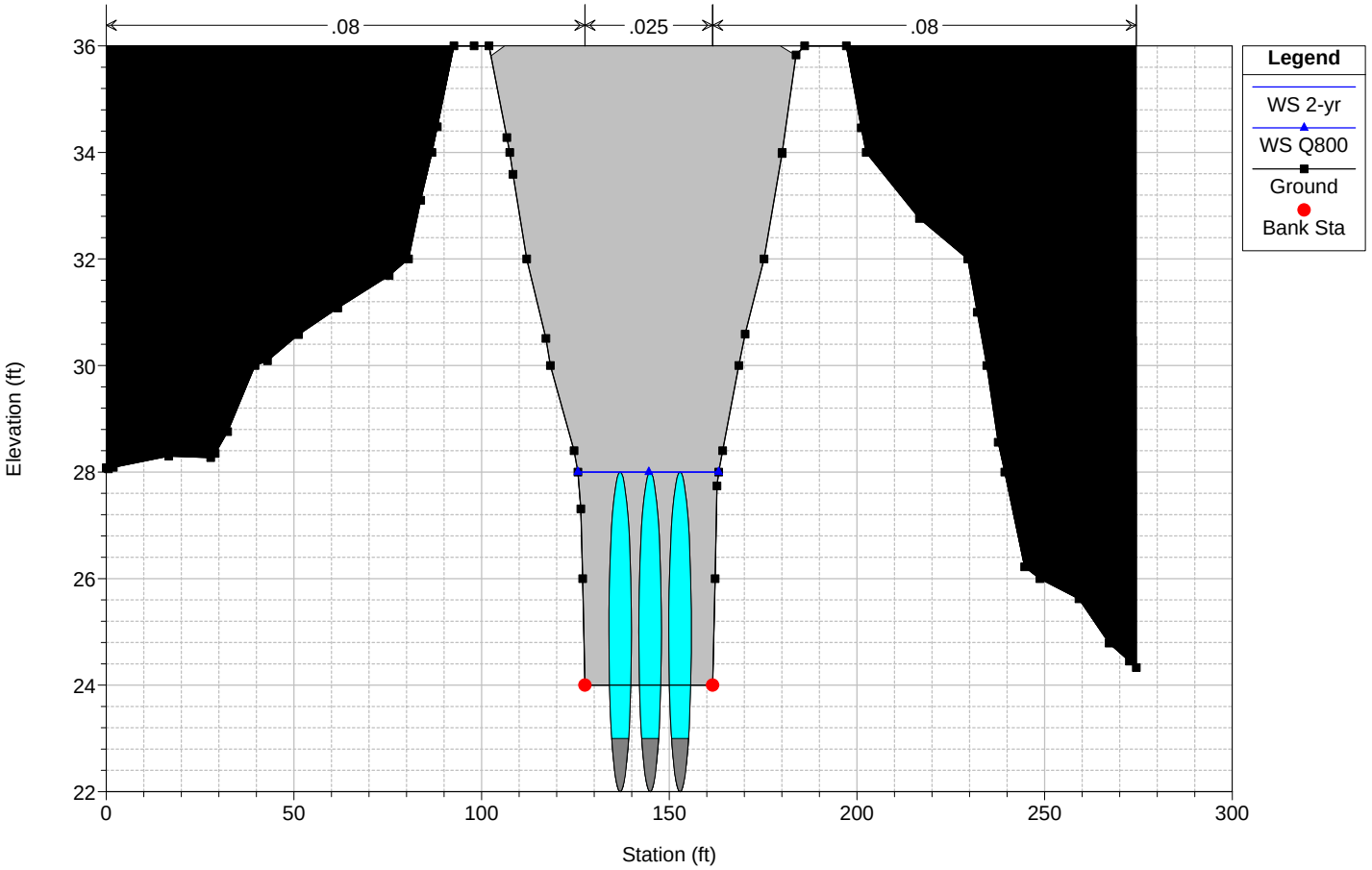

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 2549.85
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 2500 Culv DISNEY CROSSING TRIPLE 72-INCH CMPs
.08
.025
.08
Legend
WS 2-yr
WS Q800
Ground
Bank Sta
Elevation (ft)
Station (ft)

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012

Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr

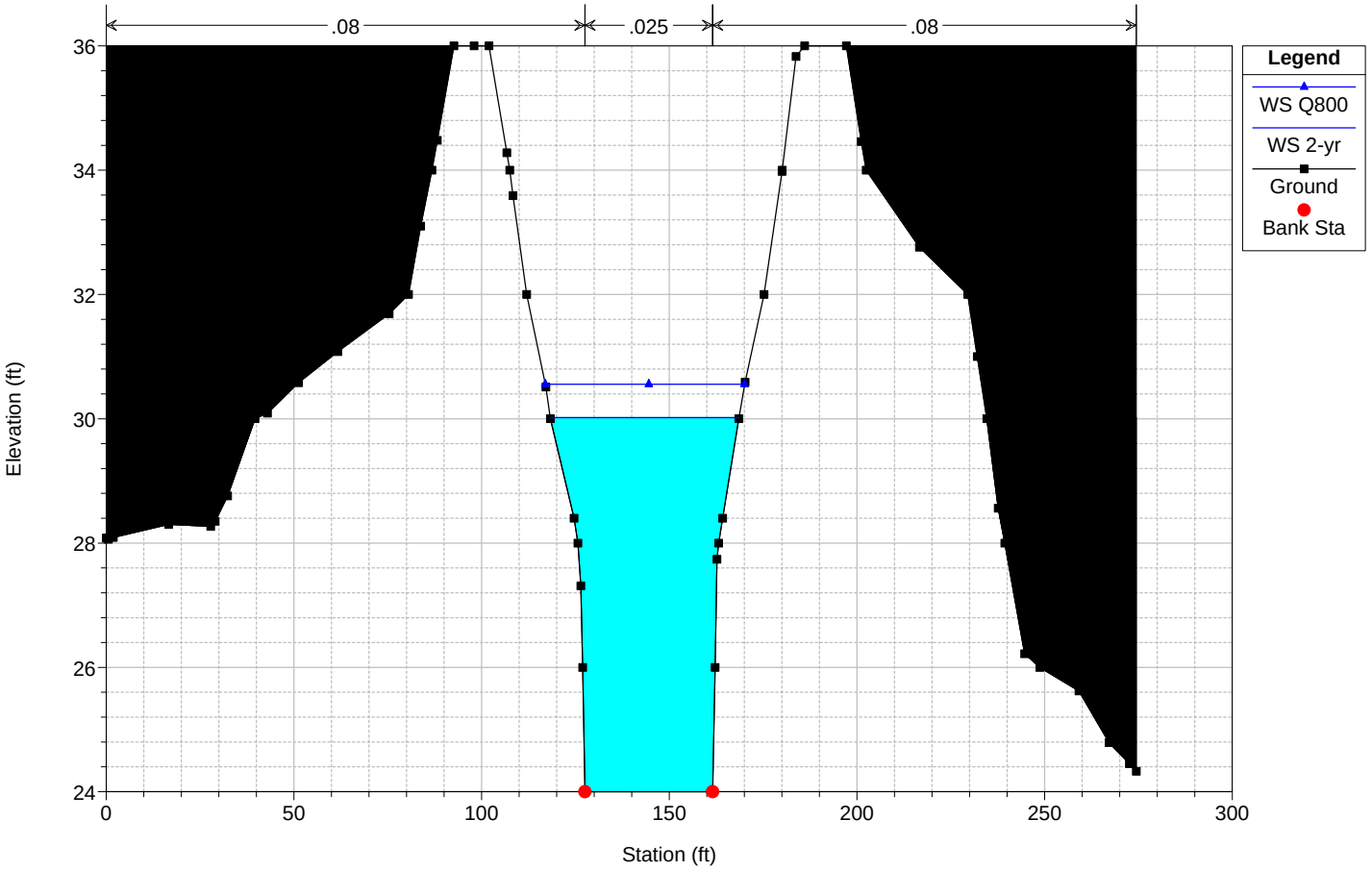
River = SG CHANNEL Reach = SG CHANNEL RS = 2500 Culv DISNEY CROSSING TRIPLE 72-INCH CMPs

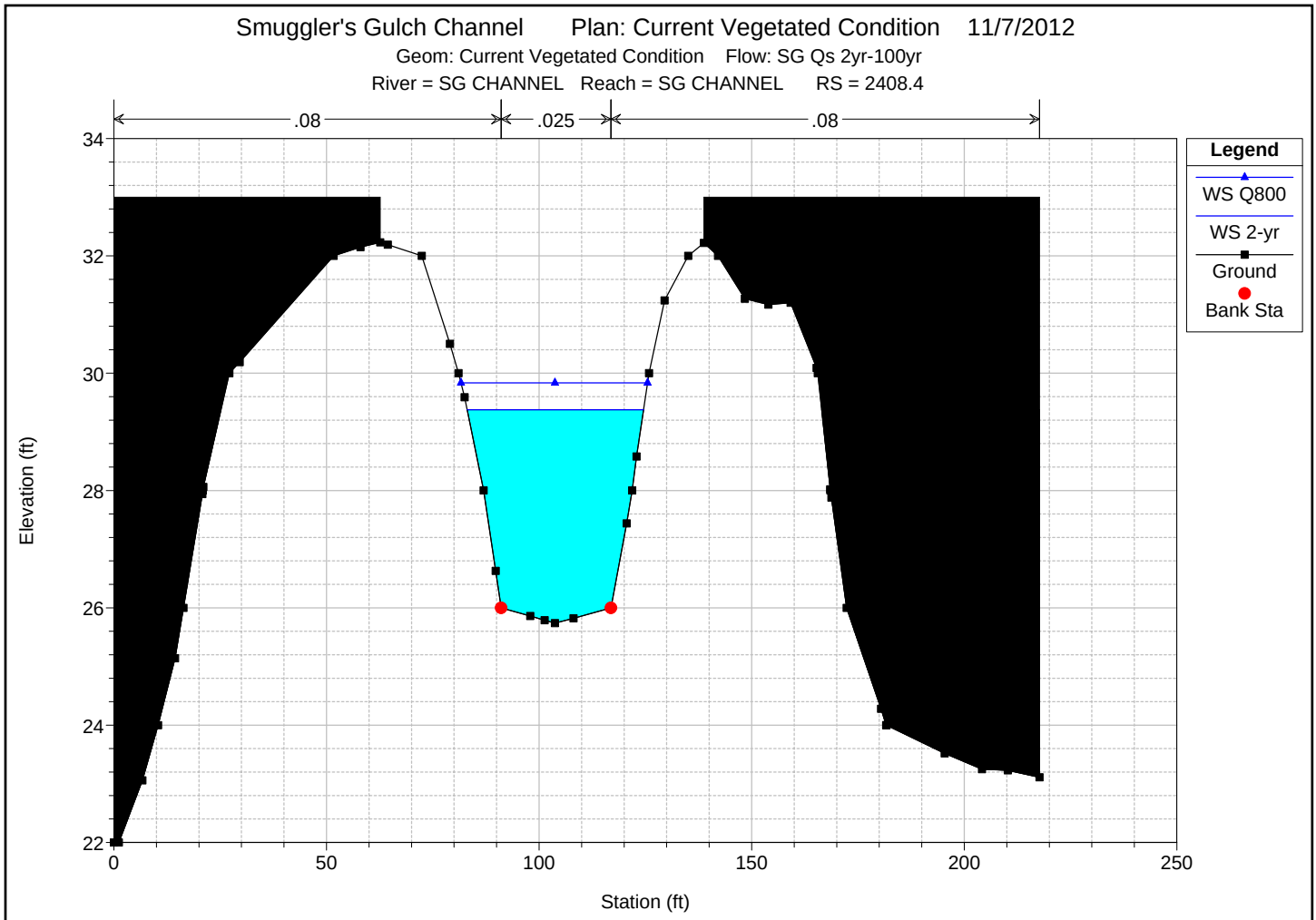


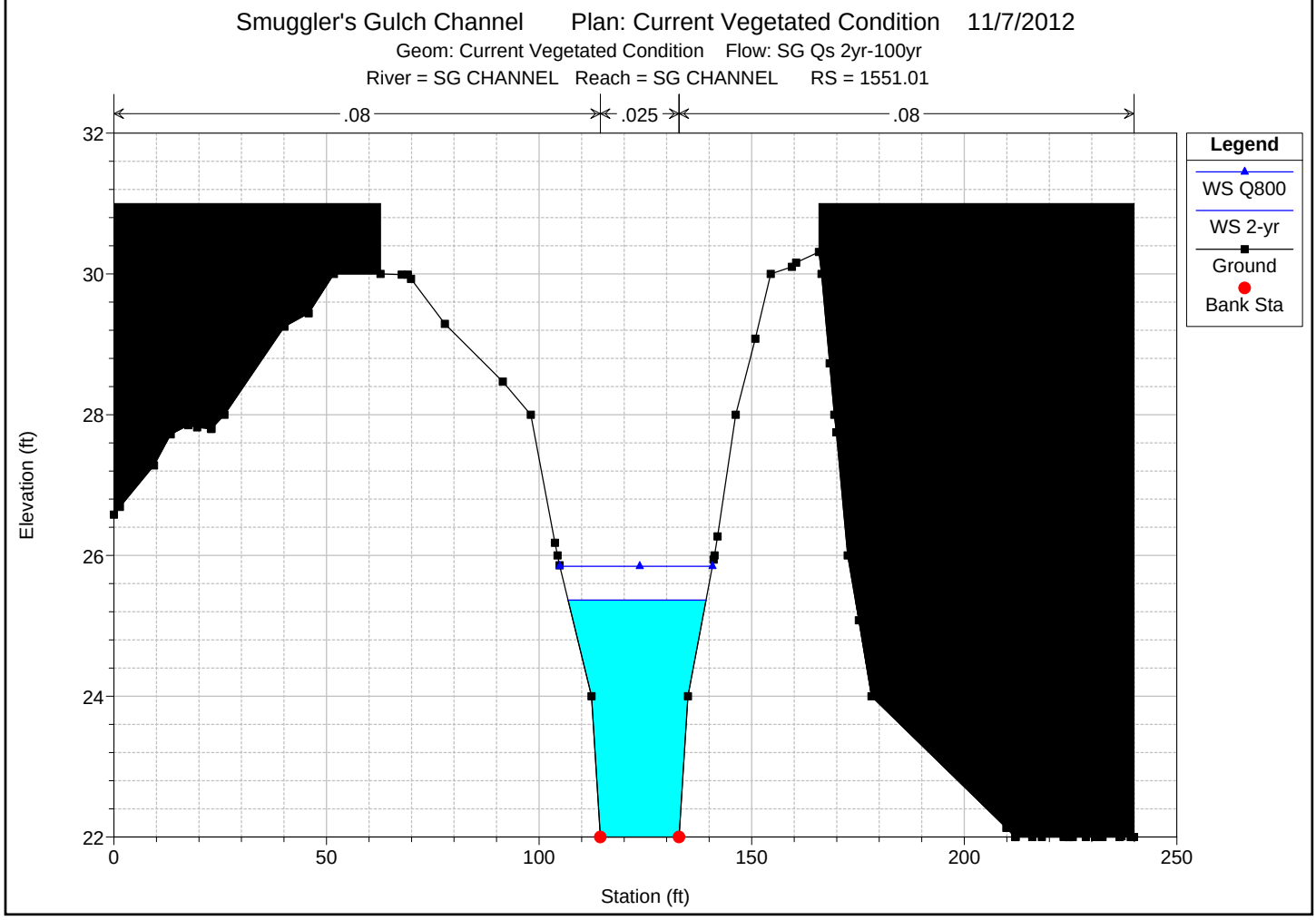
Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012

Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr

River = SG CHANNEL Reach = SG CHANNEL RS = 2489.75



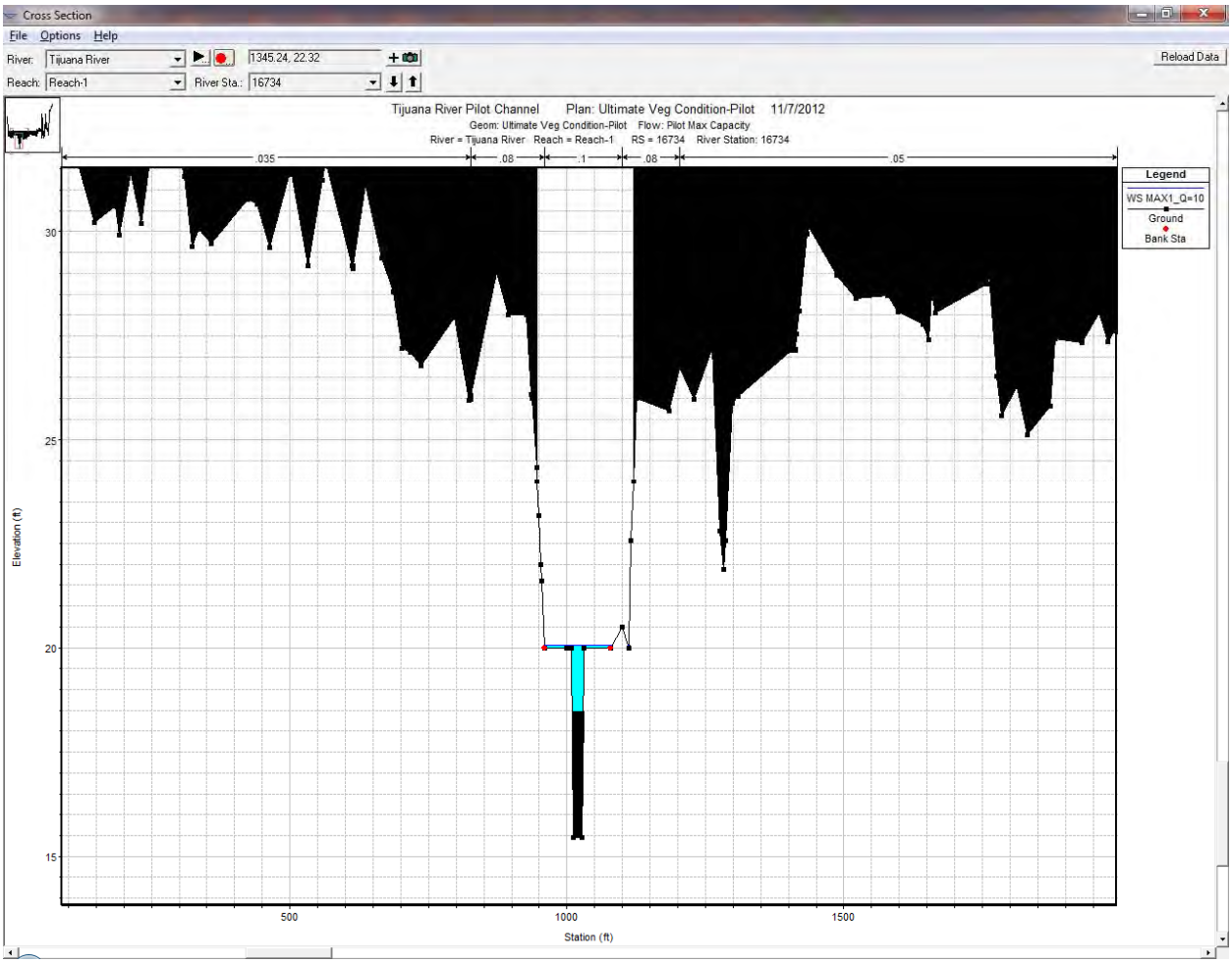

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 2408.4
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
34
32
30
28
26
24
22
0
50
100
150
200
250

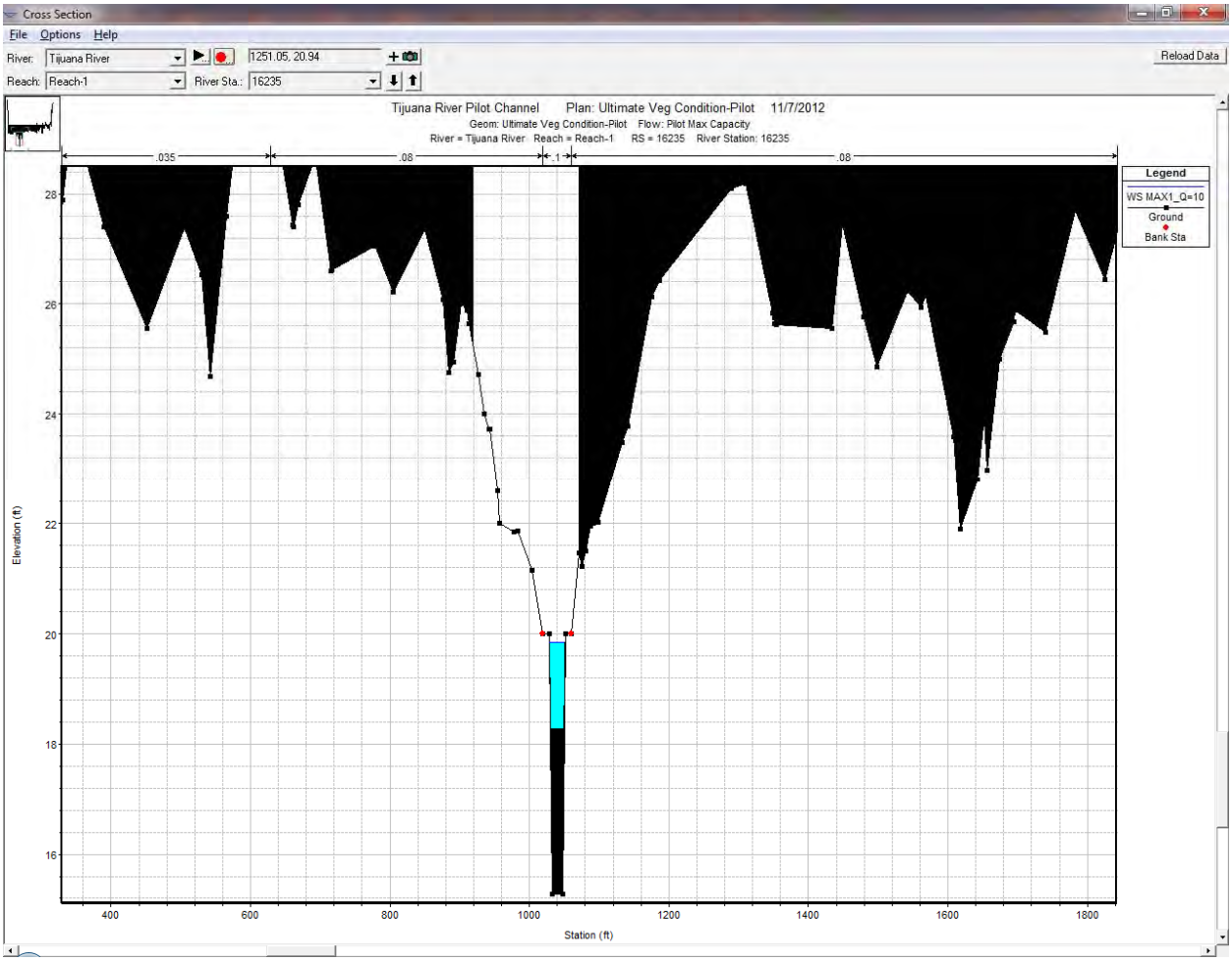

Smuggler's Gulch Channel Plan: Current Vegetated Condition 11/7/2012
Geom: Current Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 1551.01
.08
.025
.08
Legend
WS Q800
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
32
30
28
26
24
22
0
50
100
150
200
250

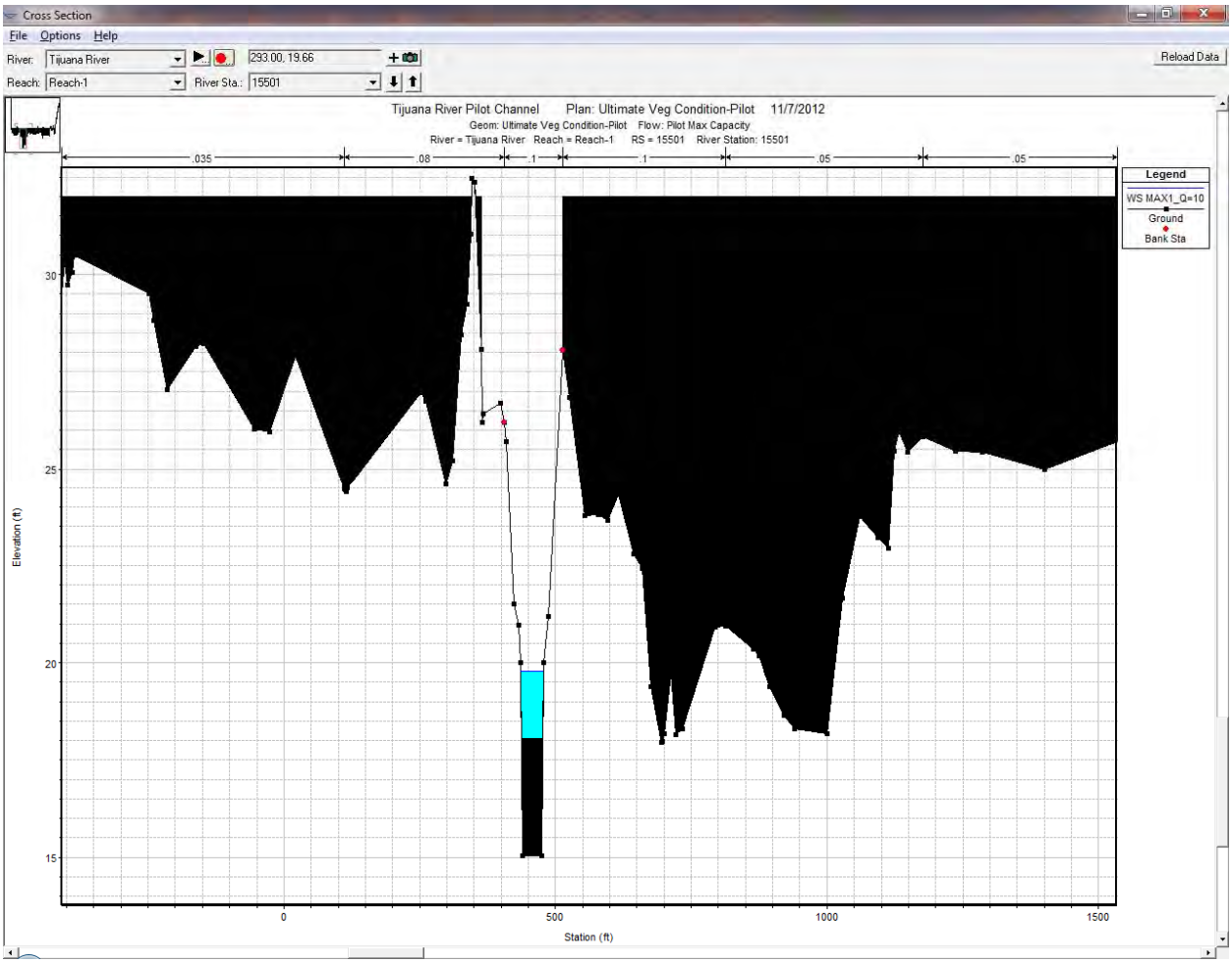
DETAILED HYDRAULIC RESULTS FOR ULTIMATE VEGETATED CONDITION MODEL

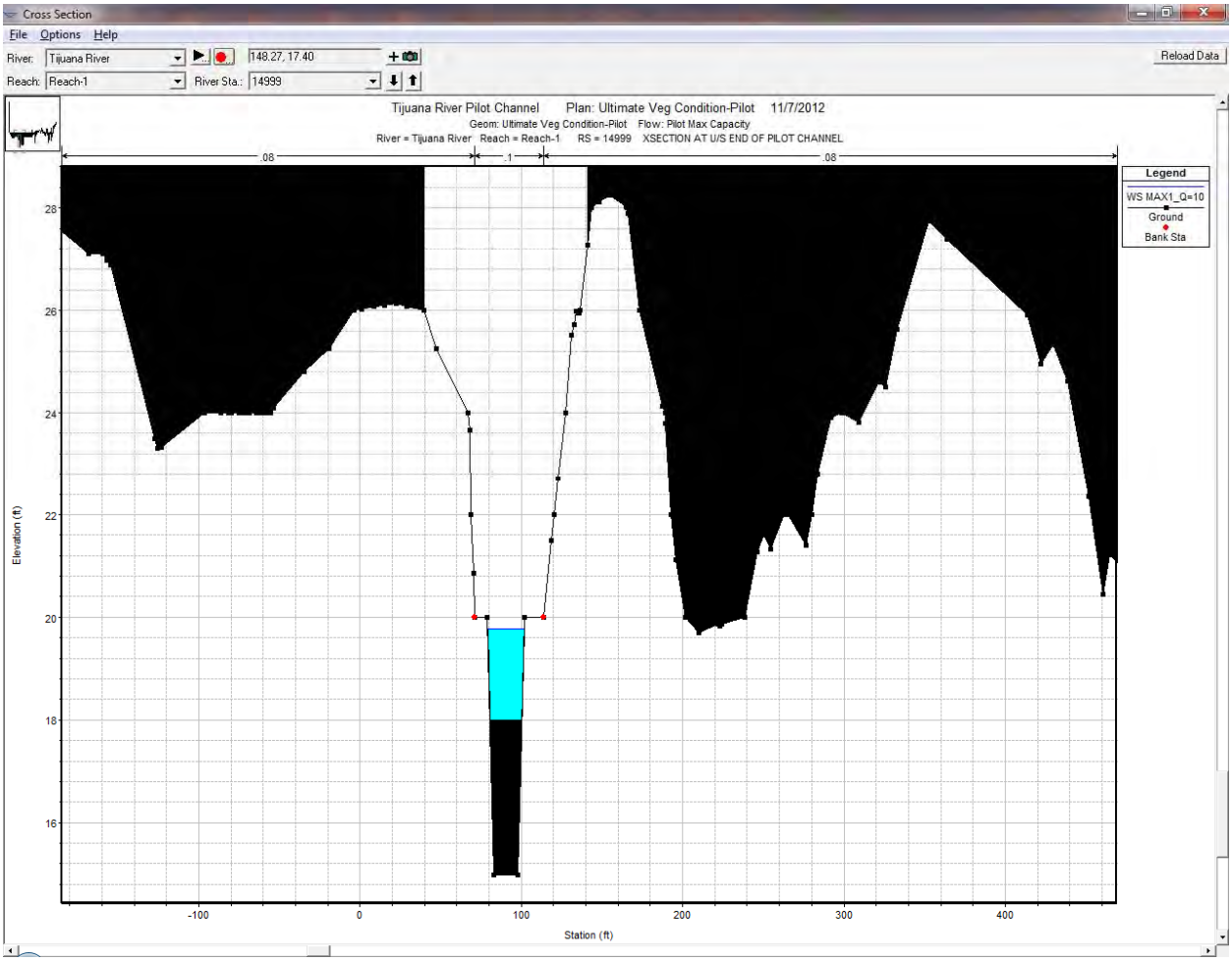
HEC-RAS Plan: UltVeg-Pilot River: Tijuana River Reach: Reach-1 Profile: MAX1_Q=10

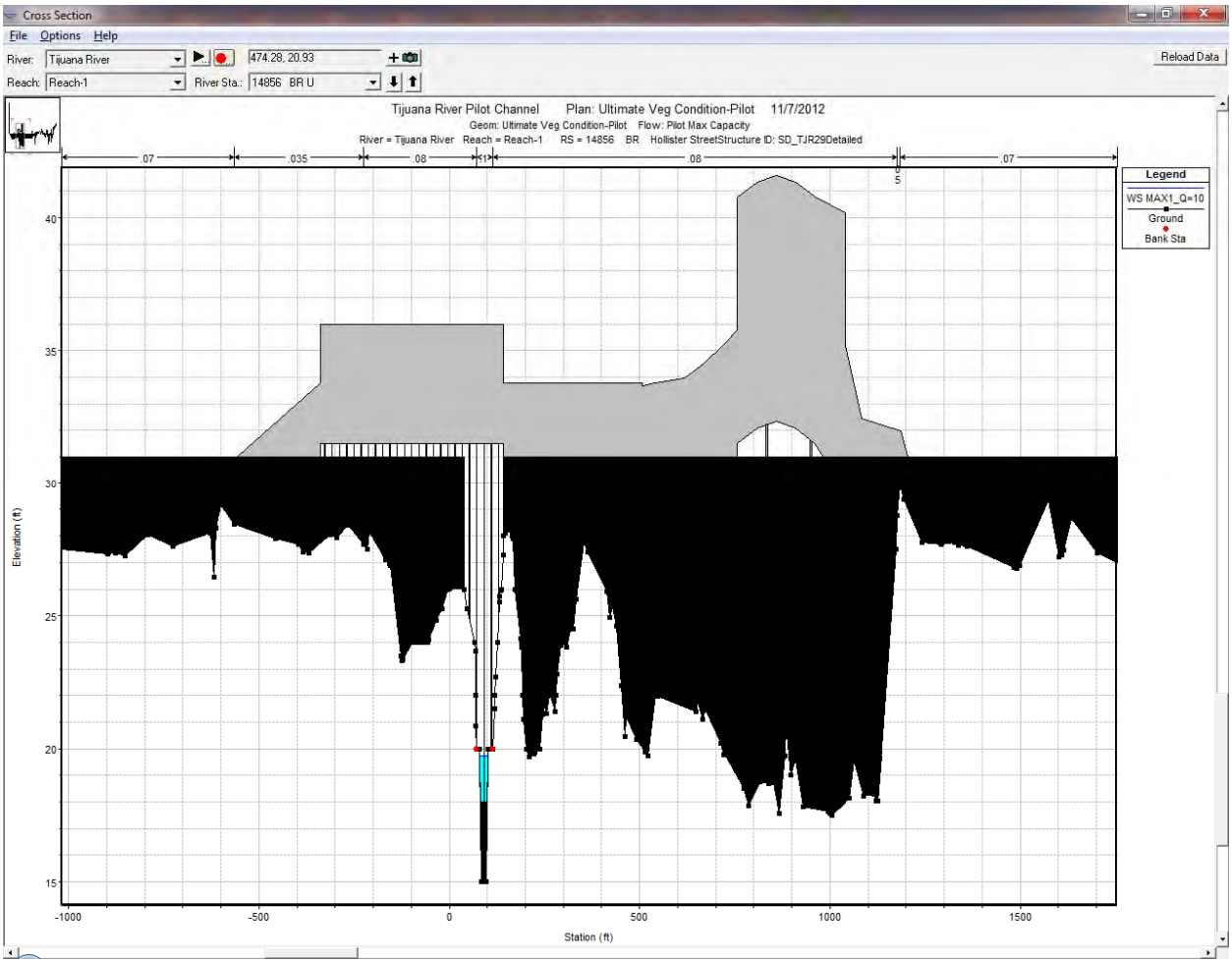
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	16734	MAX1_Q=10	10.00	18.46	20.07	18.66	20.07	0.001073	0.24	41.85	124.14	0.07
Reach-1	16235	MAX1_Q=10	10.00	18.27	19.84	18.47	19.84	0.000259	0.30	33.61	22.77	0.04
Reach-1	15501	MAX1_Q=10	10.00	18.05	19.79	18.17	19.79	0.000047	0.14	71.06	42.33	0.02
Reach-1	14999	MAX1_Q=10	10.00	18.00	19.77	18.20	19.77	0.000179	0.27	37.64	22.65	0.04
Reach-1	14856		Bridge									
Reach-1	14688	MAX1_Q=10	10.00	17.90	19.72	18.10	19.73	0.000163	0.26	38.72	22.67	0.03
Reach-1	14541	MAX1_Q=10	10.00	17.85	19.70	18.05	19.71	0.000154	0.25	39.45	22.76	0.03
Reach-1	13805	MAX1_Q=10	10.00	17.68	19.64	17.88	19.64	0.000144	0.25	39.79	21.63	0.03
Reach-1	134.5	MAX1_Q=10	10.00	17.48	19.56	17.70	19.56	0.000153	0.27	37.73	18.92	0.03
Reach-1	127.5	MAX1_Q=10	10.00	17.20	19.49	17.40	19.49	0.000077	0.20	49.50	23.58	0.02
Reach-1	122	MAX1_Q=10	10.00	17.00	19.44	17.20	19.45	0.000062	0.19	53.39	23.97	0.02
Reach-1	120	MAX1_Q=10	10.00	16.91	19.44	17.11	19.44	0.000056	0.18	55.21	24.05	0.02
Reach-1	119	MAX1_Q=10	10.00	16.92	19.43	17.12	19.43	0.000057	0.18	54.80	23.84	0.02
Reach-1	108	MAX1_Q=10	10.00	18.04	19.31	18.22	19.31	0.000441	0.34	29.04	23.00	0.05
Reach-1	97.5	MAX1_Q=10	10.00	17.60	18.70	17.78	18.70	0.000712	0.40	25.00	23.00	0.07
Reach-1	93	MAX1_Q=10	10.00	17.43	17.97	17.61	17.98	0.007424	0.82	12.15	23.00	0.20
Reach-1	90	MAX1_Q=10	10.00	9.77	10.44	10.16	10.46	0.010105	0.96	10.40	28.12	0.28
Reach-1	85	MAX1_Q=10	10.00	6.39	7.50	6.87	7.51	0.002555	0.67	14.92	24.54	0.15
Reach-1	77.5	MAX1_Q=10	10.00	4.00	4.81	4.41	4.84	0.003704	1.20	8.30	15.12	0.29


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 16734
1345.24, 22.32
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 16734 River Station: 16734
.035
.08
.1
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
30
25
20
15
500
1000
1500
Station (ft)

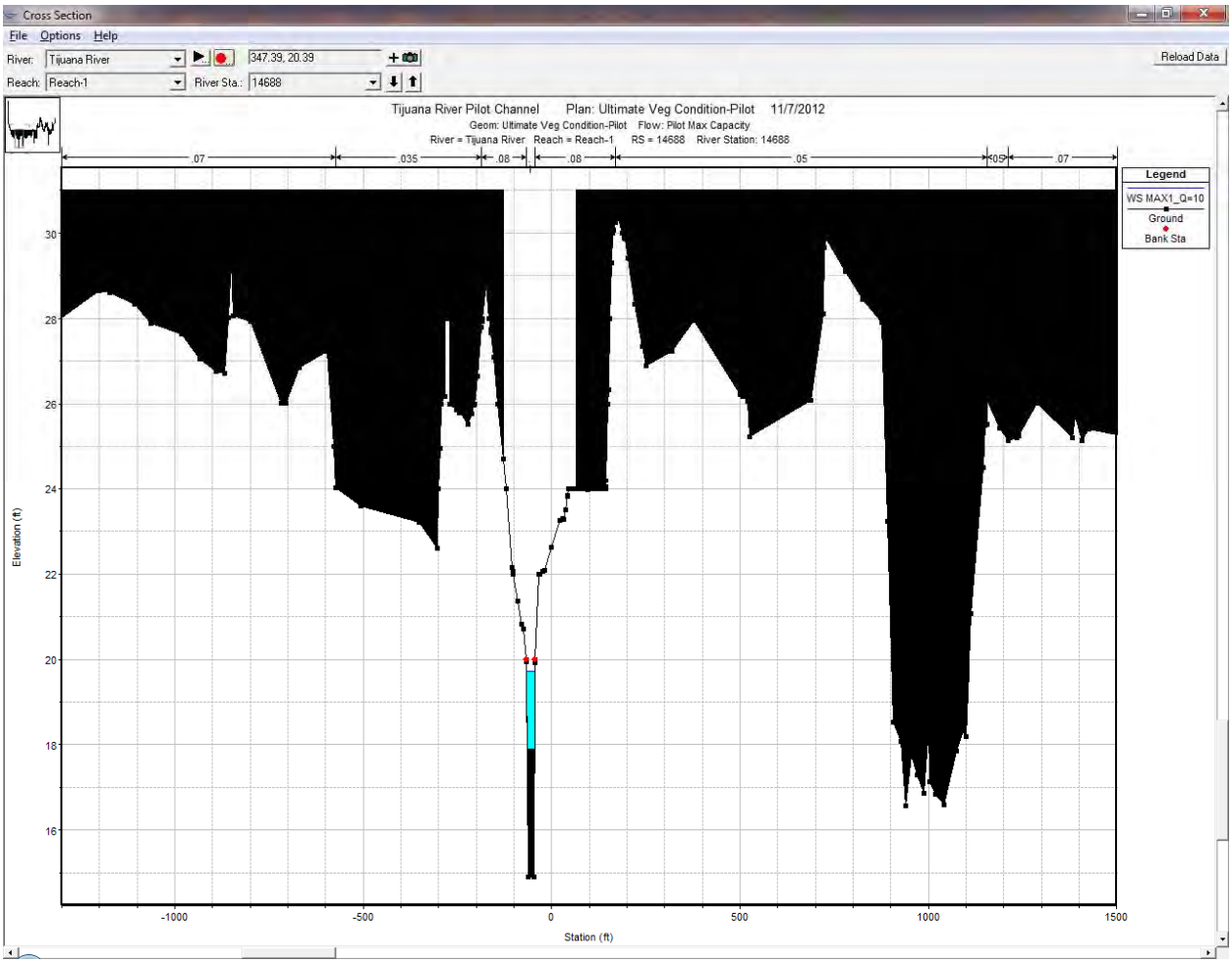

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 16235
1251.05, 20.94
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 16235 River Station: 16235
.035
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
28
26
24
22
20
18
16
400
600
800
1000
1200
1400
1600
1800
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 15501
293.00, 19.66
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 15501 River Station: 15501
.035
.08
.1
.1
.05
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
30
25
20
15
0
500
1000
1500
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14999
148.27, 17.40
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14999 XSECTION AT U/S END OF PILOT CHANNEL
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
28
26
24
22
20
18
16
-100
0
100
200
300
400
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14856 BR U
474.28, 20.93
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.08
.07
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14856 BR D
549.52, 27.33
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.08
.05
.07
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)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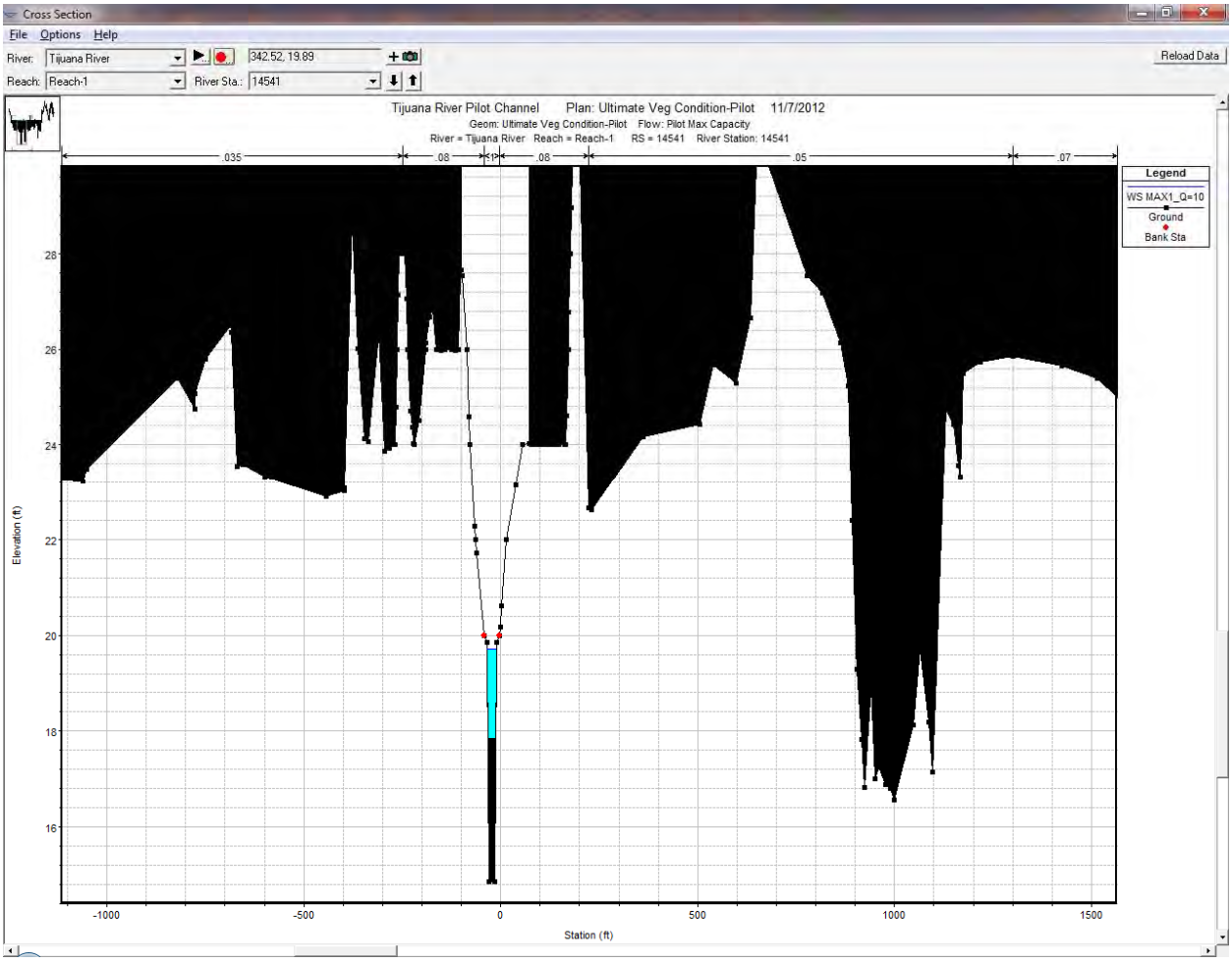
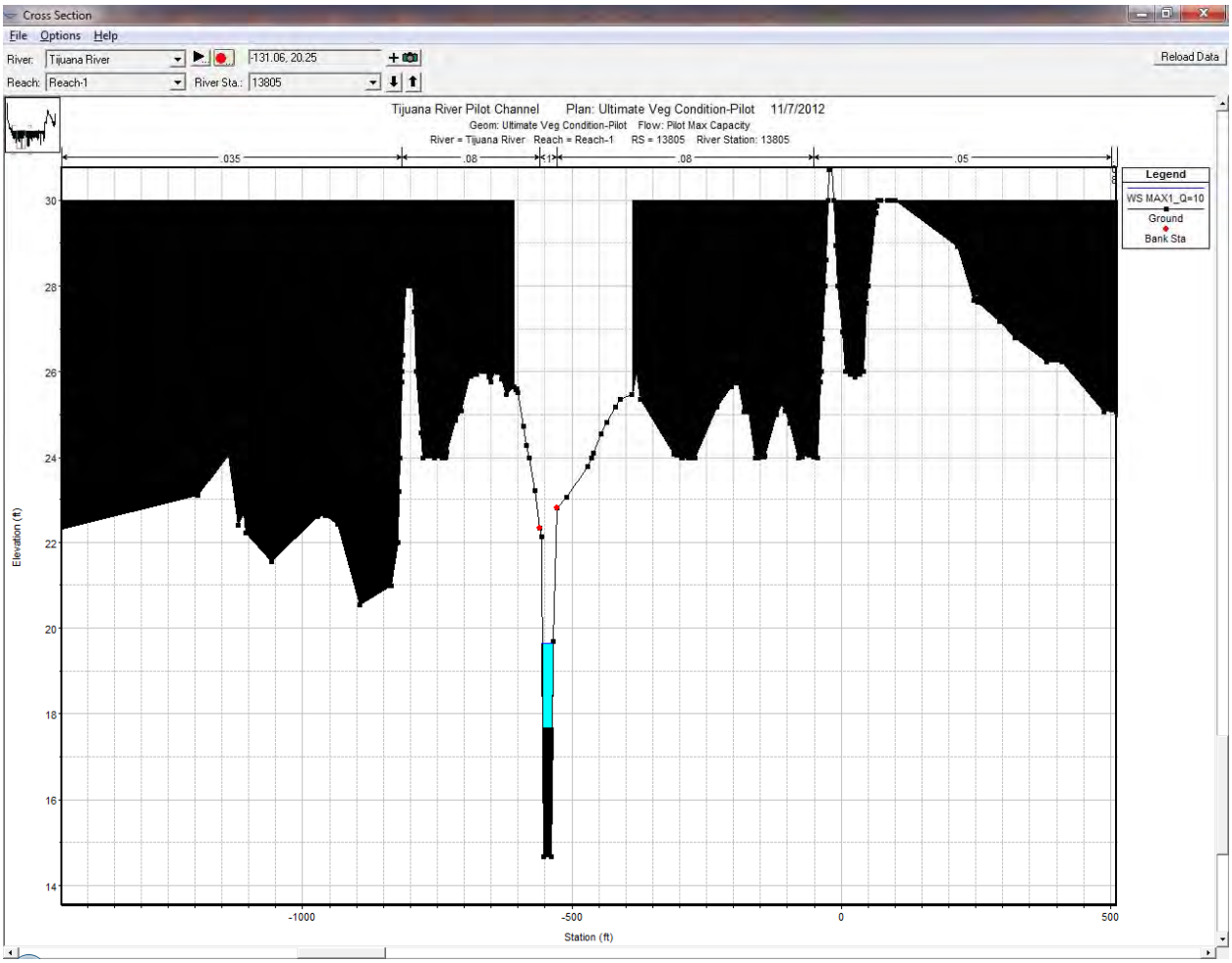
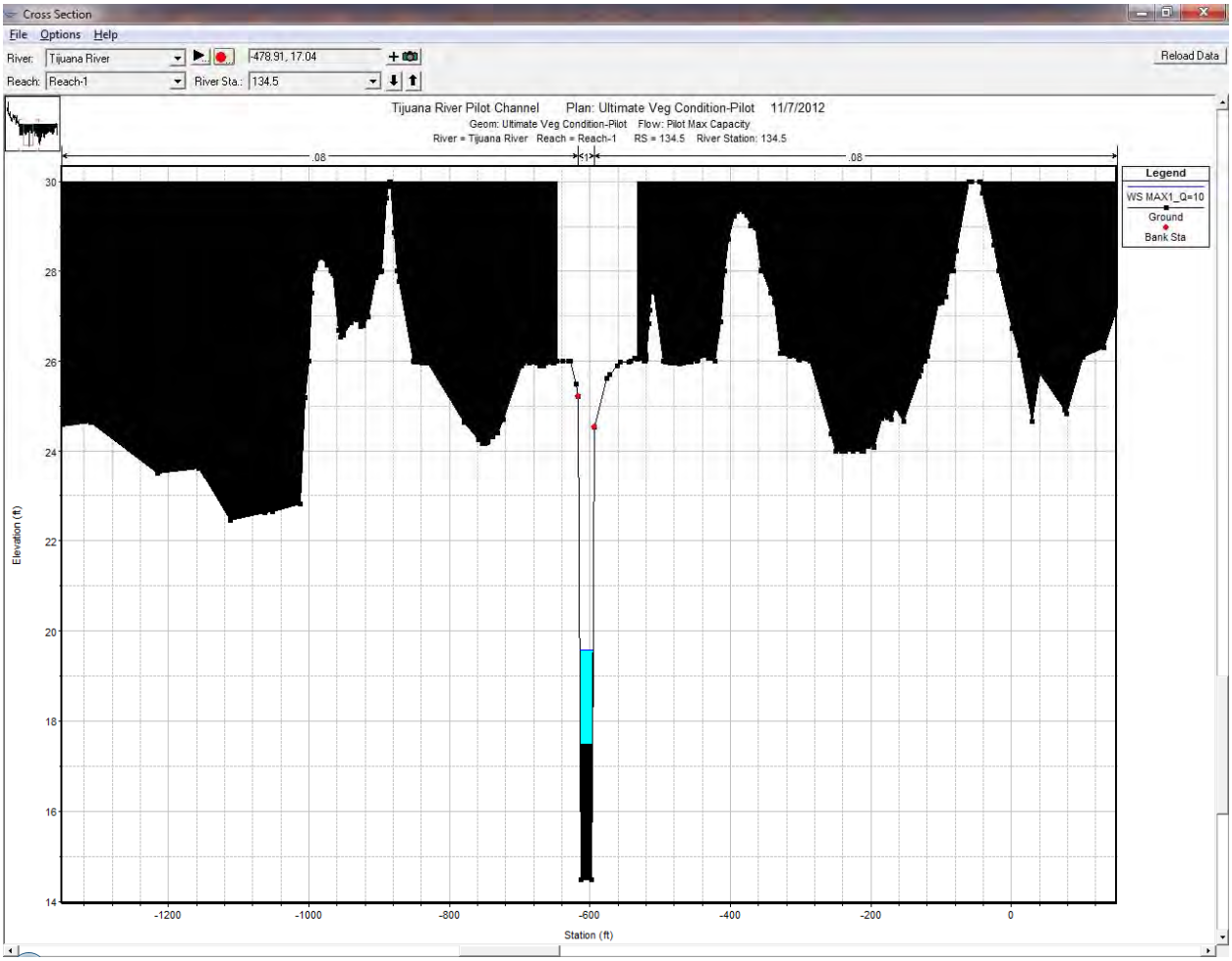
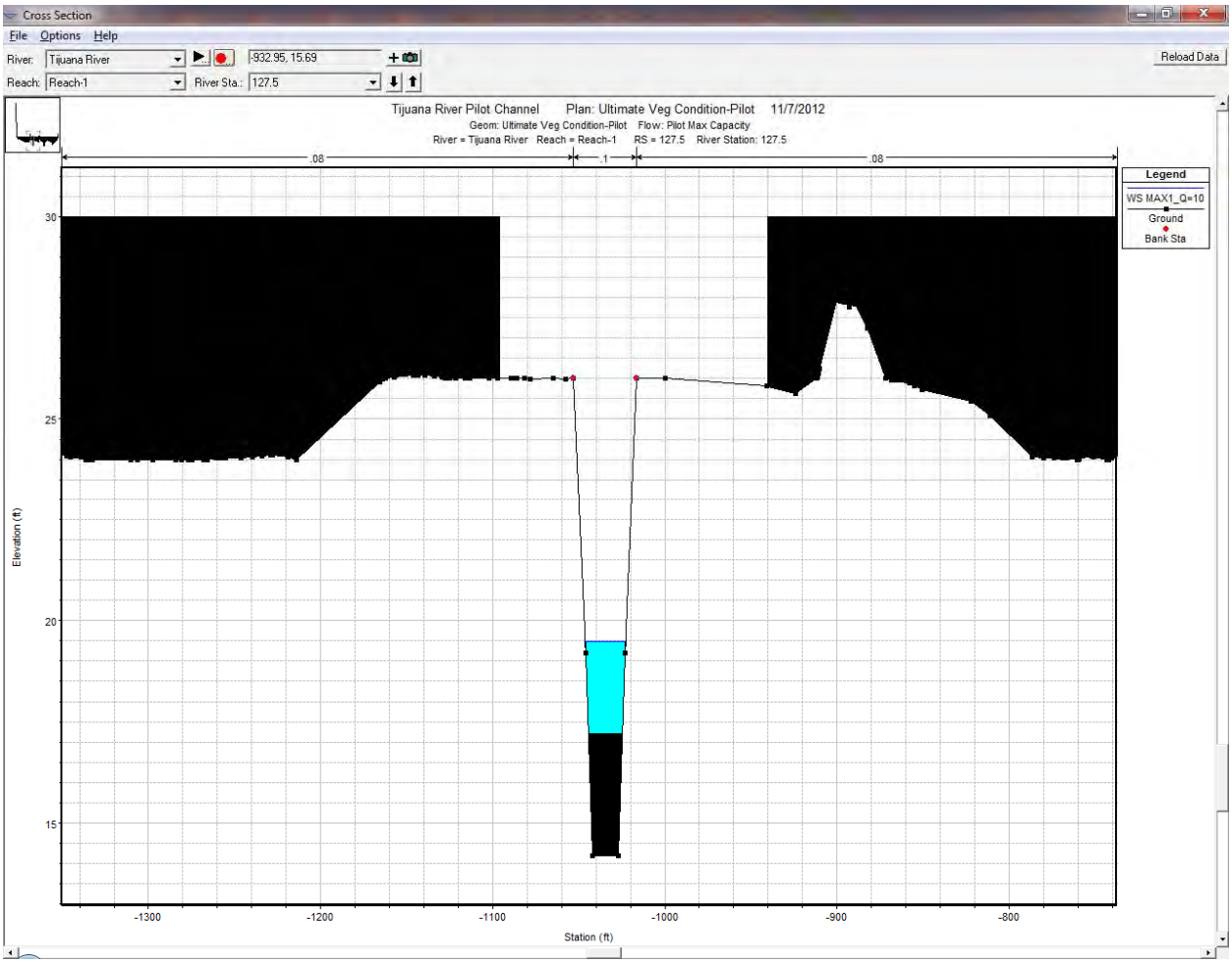
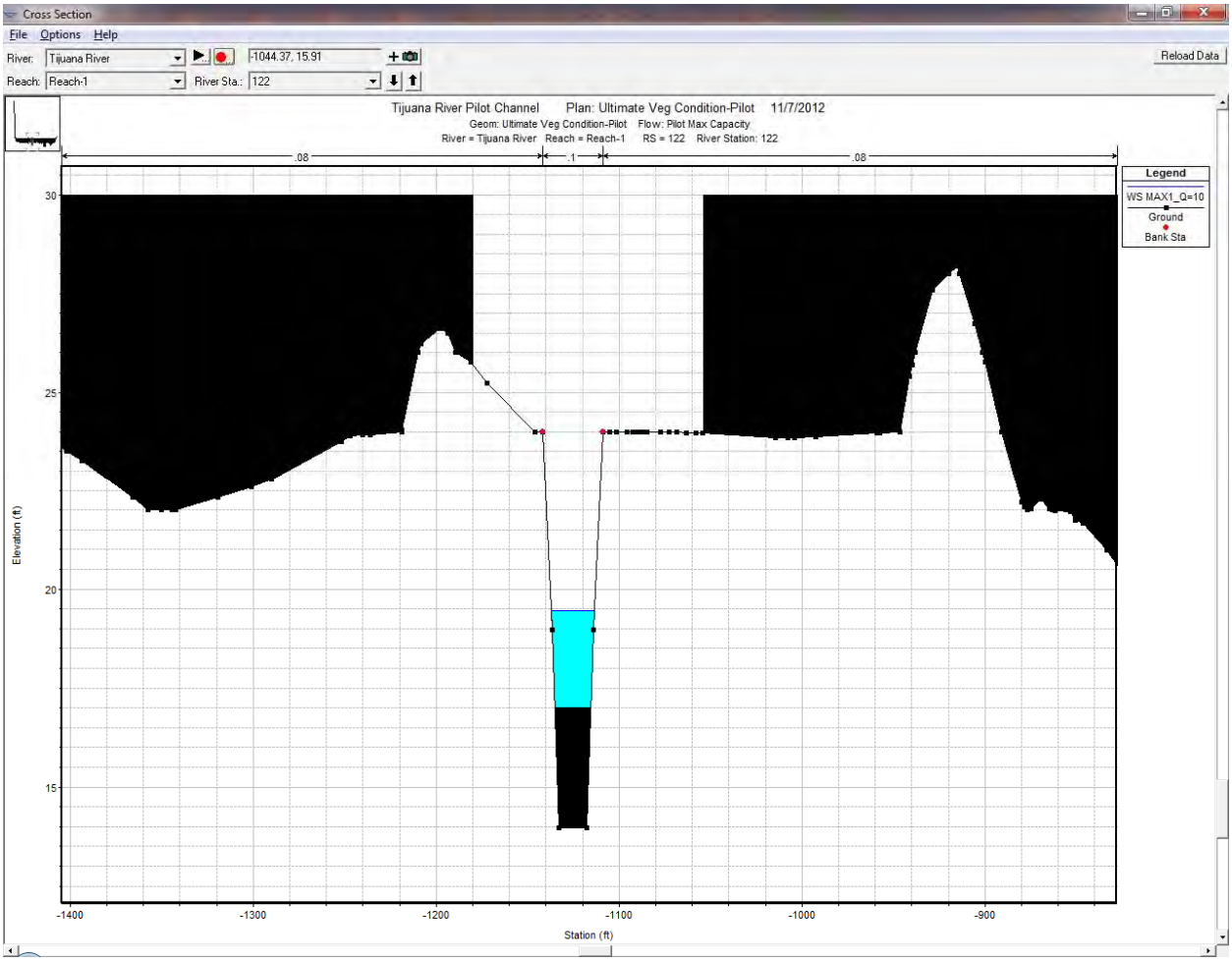
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14688
347.39, 20.39
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14688 River Station: 14688
.07
.035
.08
.08
.05
.07
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

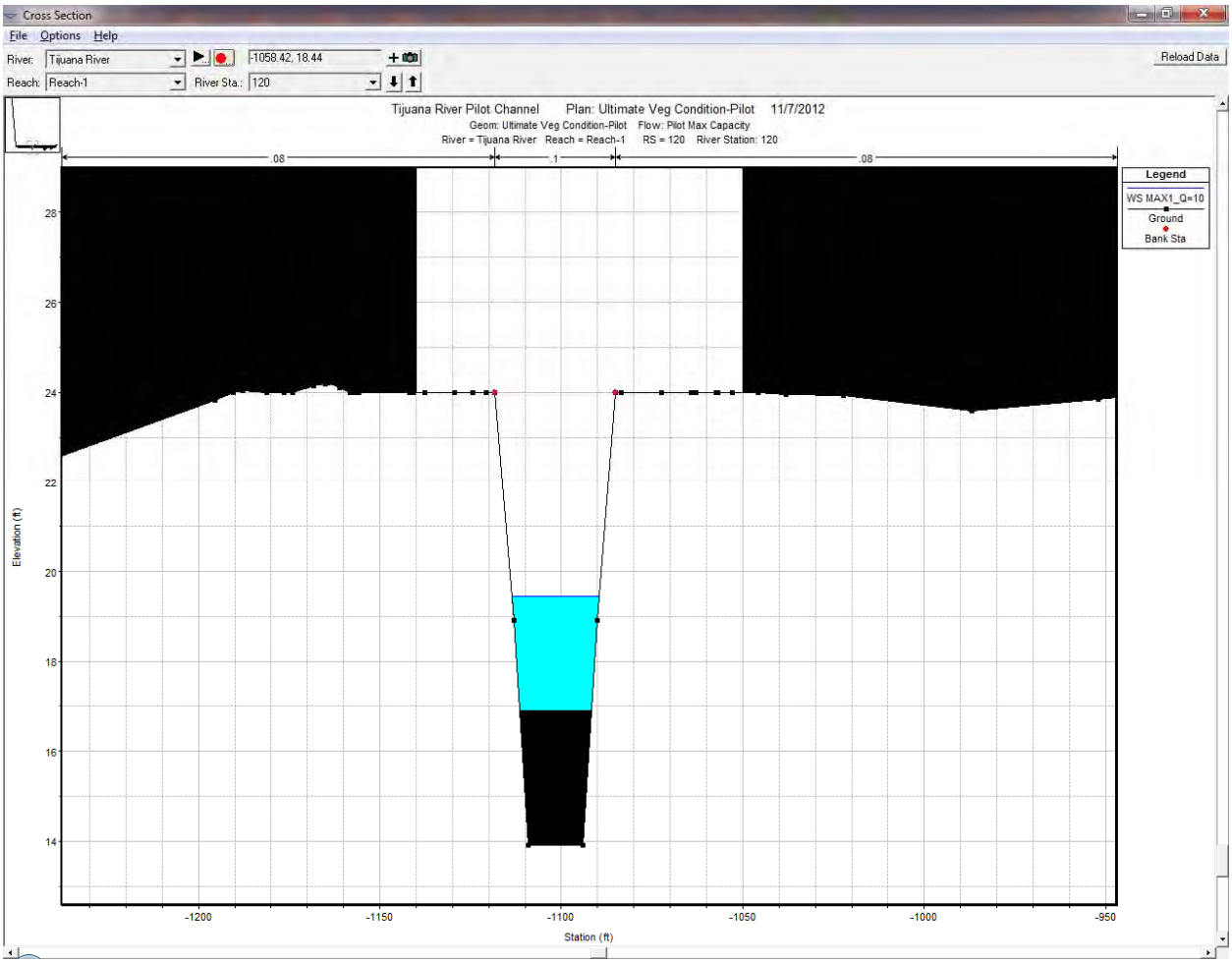

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14541
342.52, 19.89
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14541 River Station: 14541
.035
.08
.08
.05
.07
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

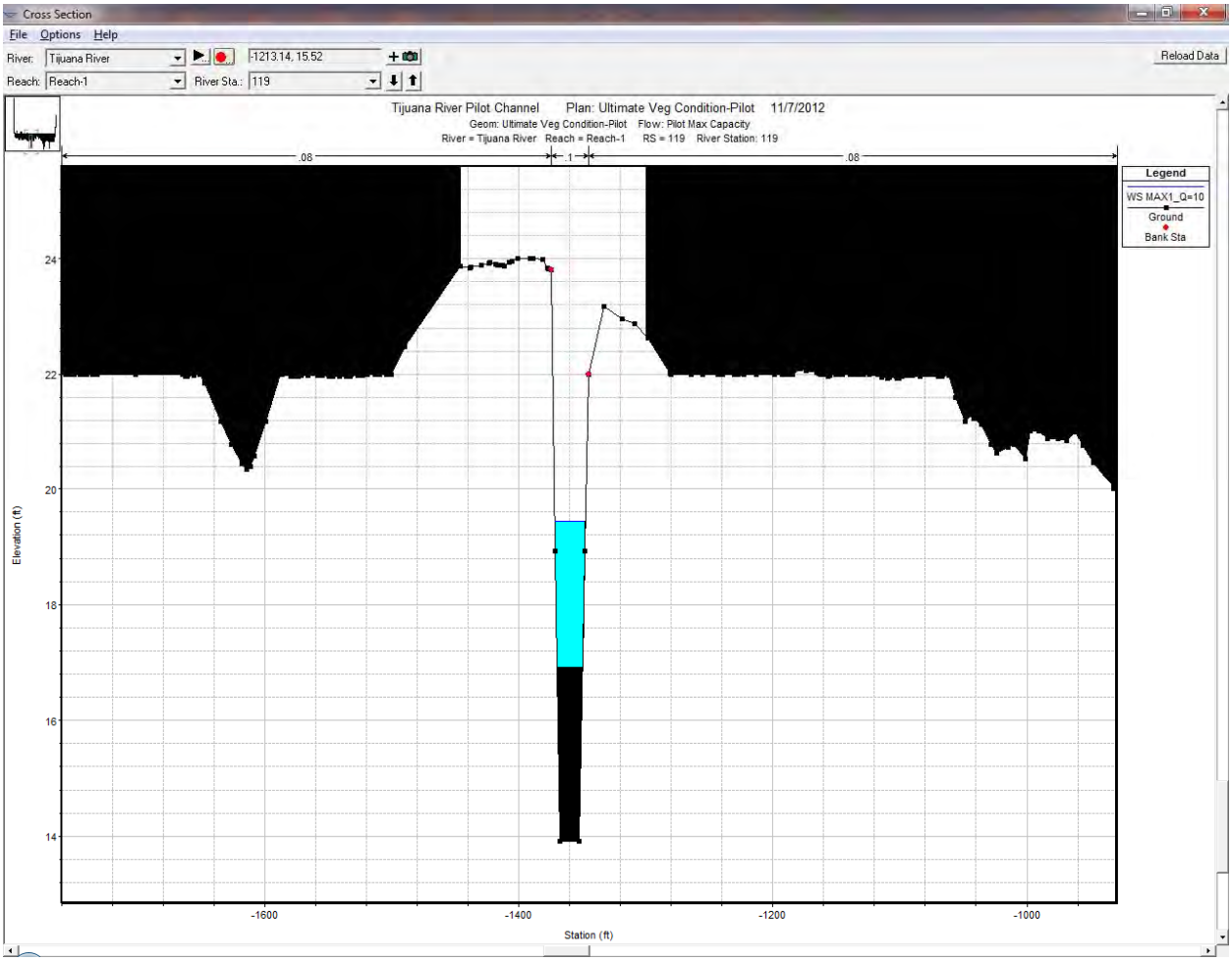

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-131.06, 20.25
River Sta.: 13805
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 13805 River Station: 13805
.035
.08
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

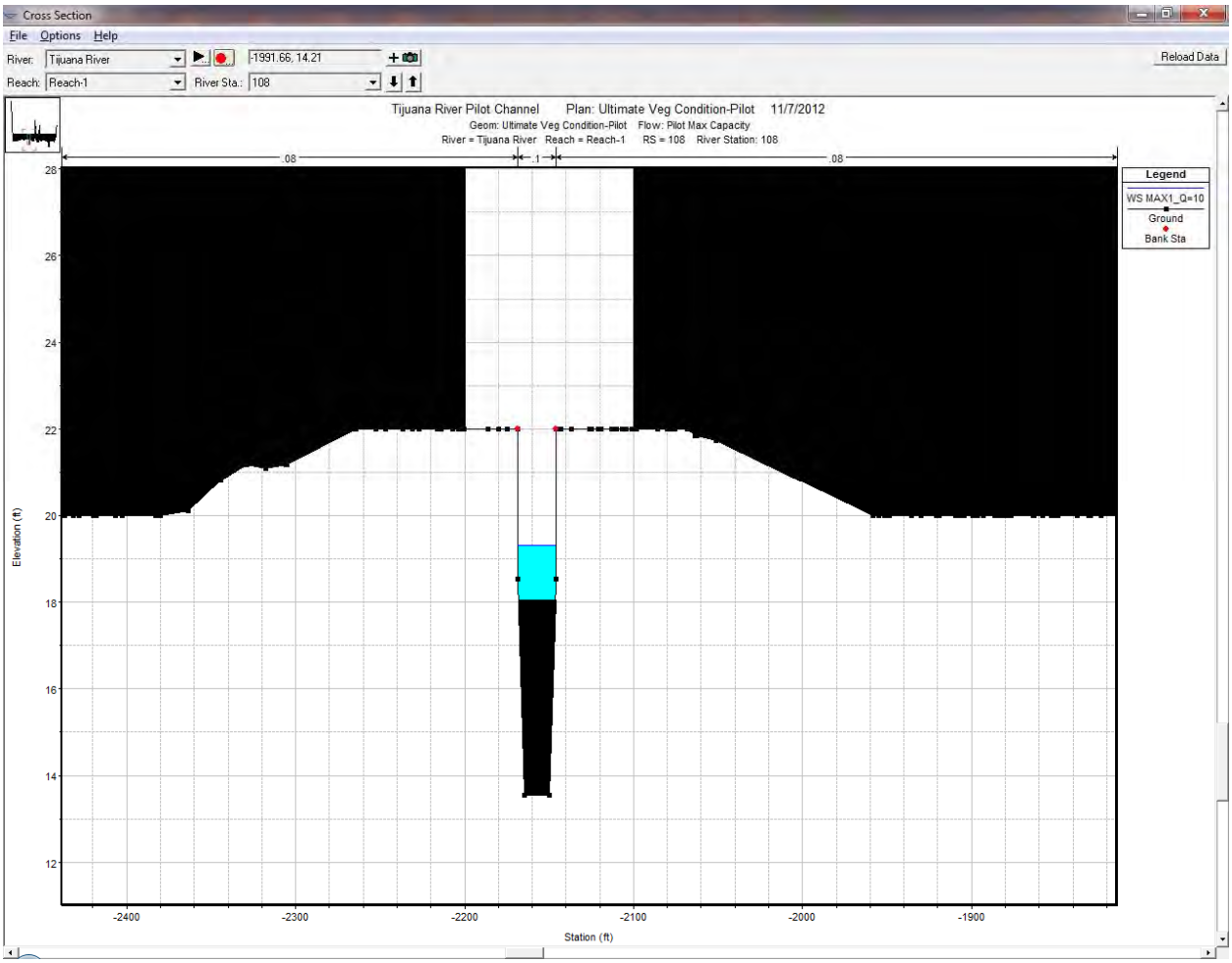

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-478.91, 17.04
River Sta.: 134.5
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 134.5 River Station: 134.5
.08
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

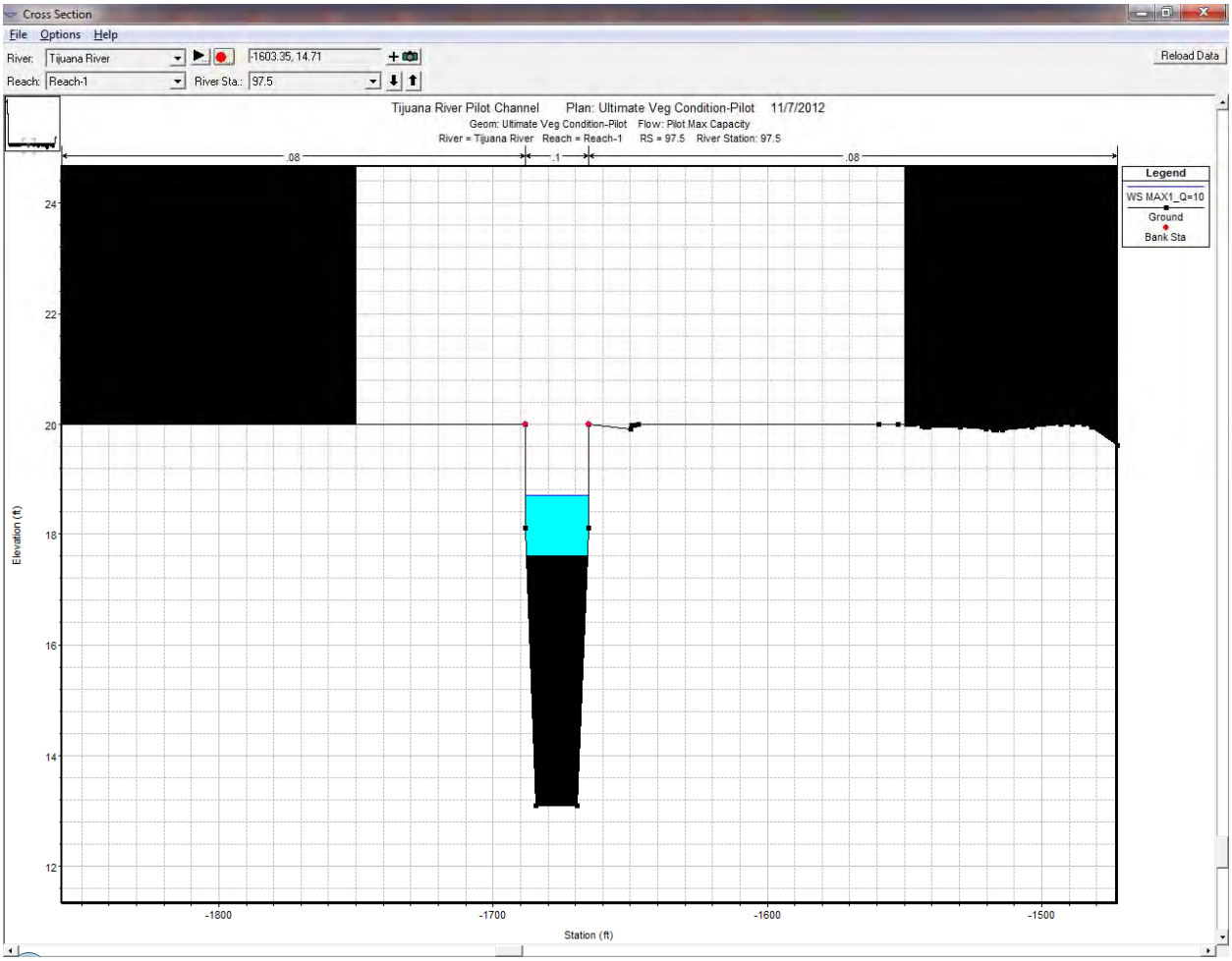

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-932.95, 15.69
River Sta.: 127.5
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 127.5 River Station: 127.5
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
30
25
20
15
Elevation (ft)
-1300
-1200
-1100
-1000
-900
-800
Station (ft)

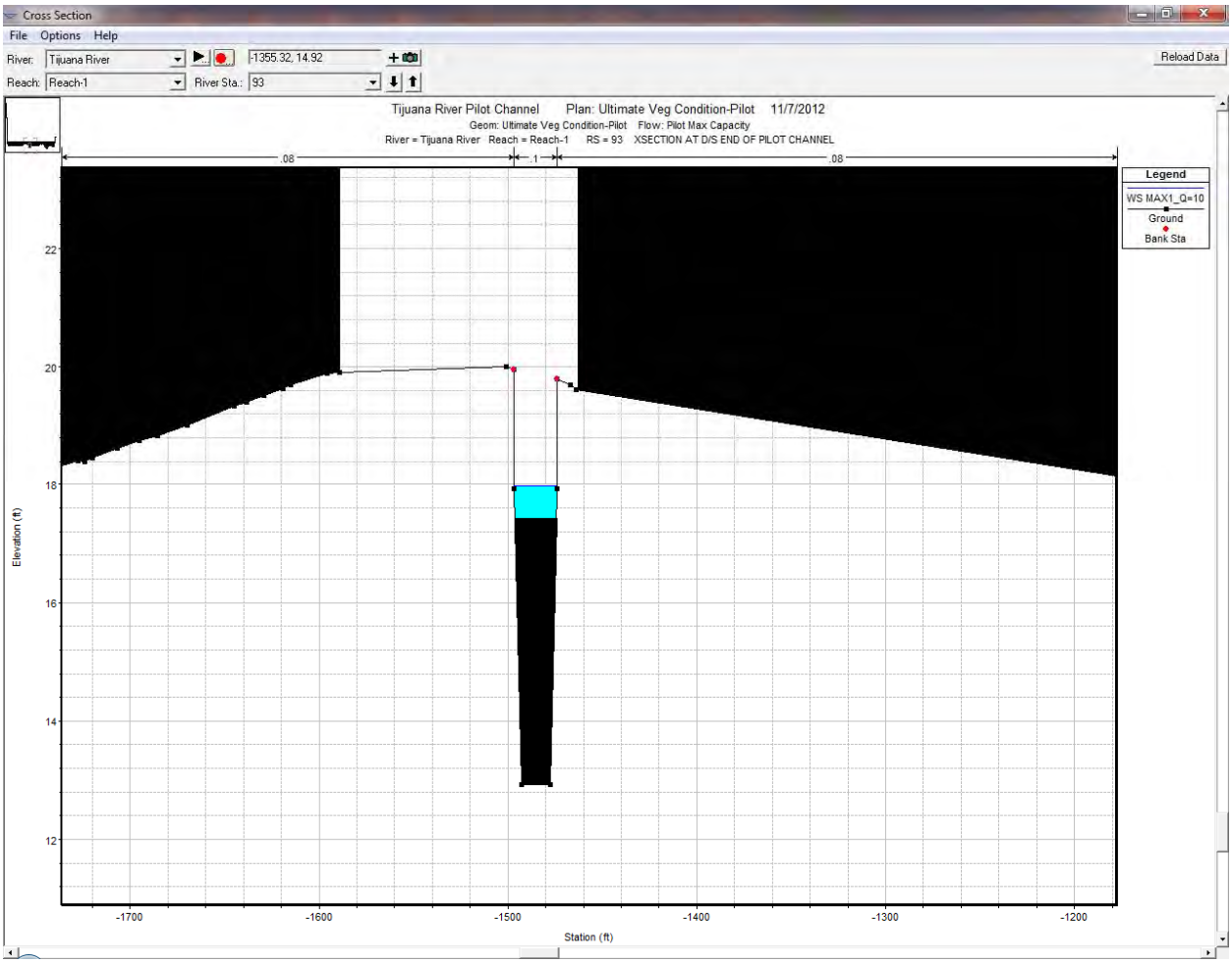

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-1044.37, 15.91
River Sta.: 122
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 122 River Station: 122
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
30
25
20
15
Elevation (ft)
-1400
-1300
-1200
-1100
-1000
-900
Station (ft)

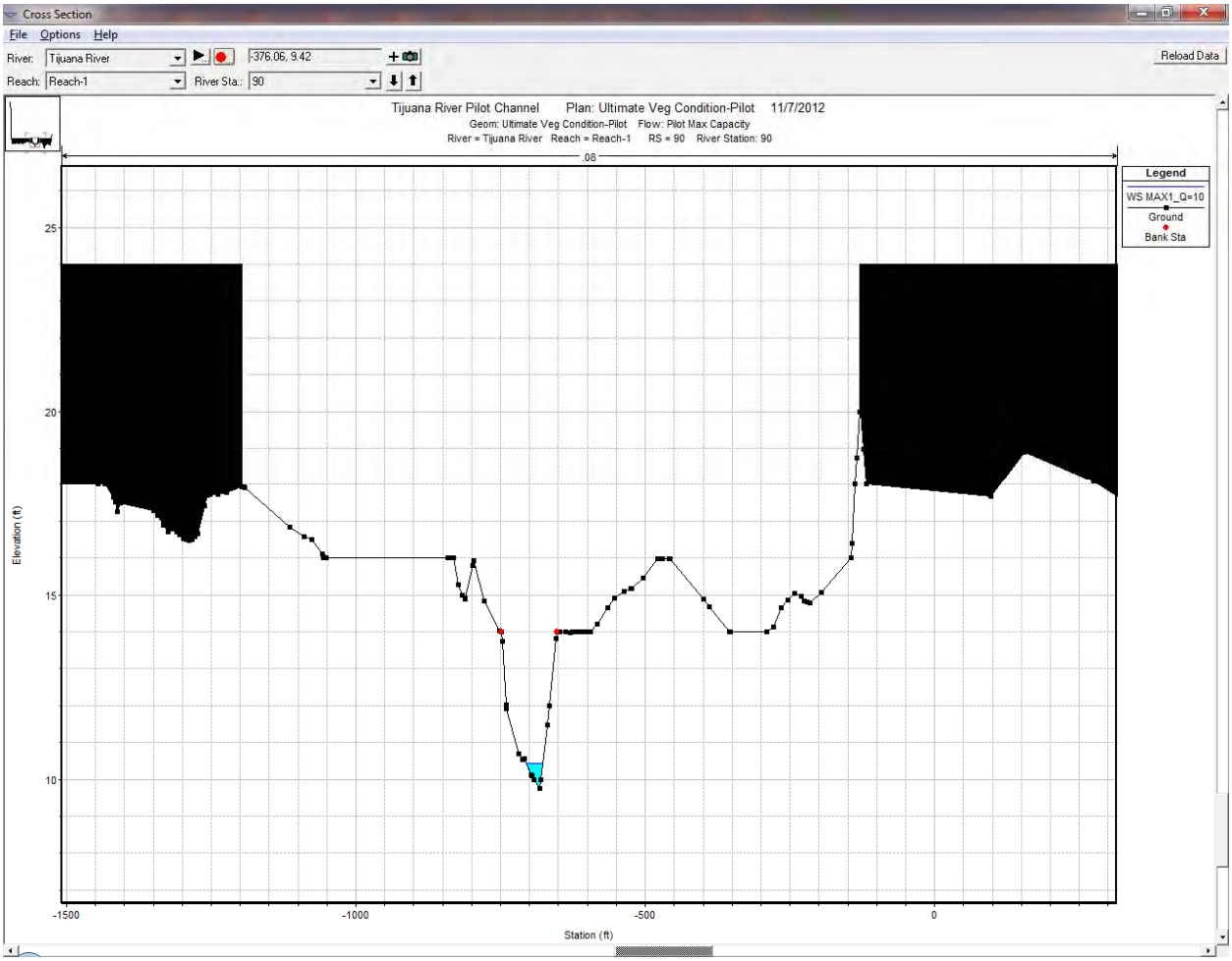

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 120
-1058.42, 18.44
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 120 River Station: 120
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
28
26
24
22
20
18
16
14
-1200
-1150
-1100
-1050
-1000
-950
Station (ft)

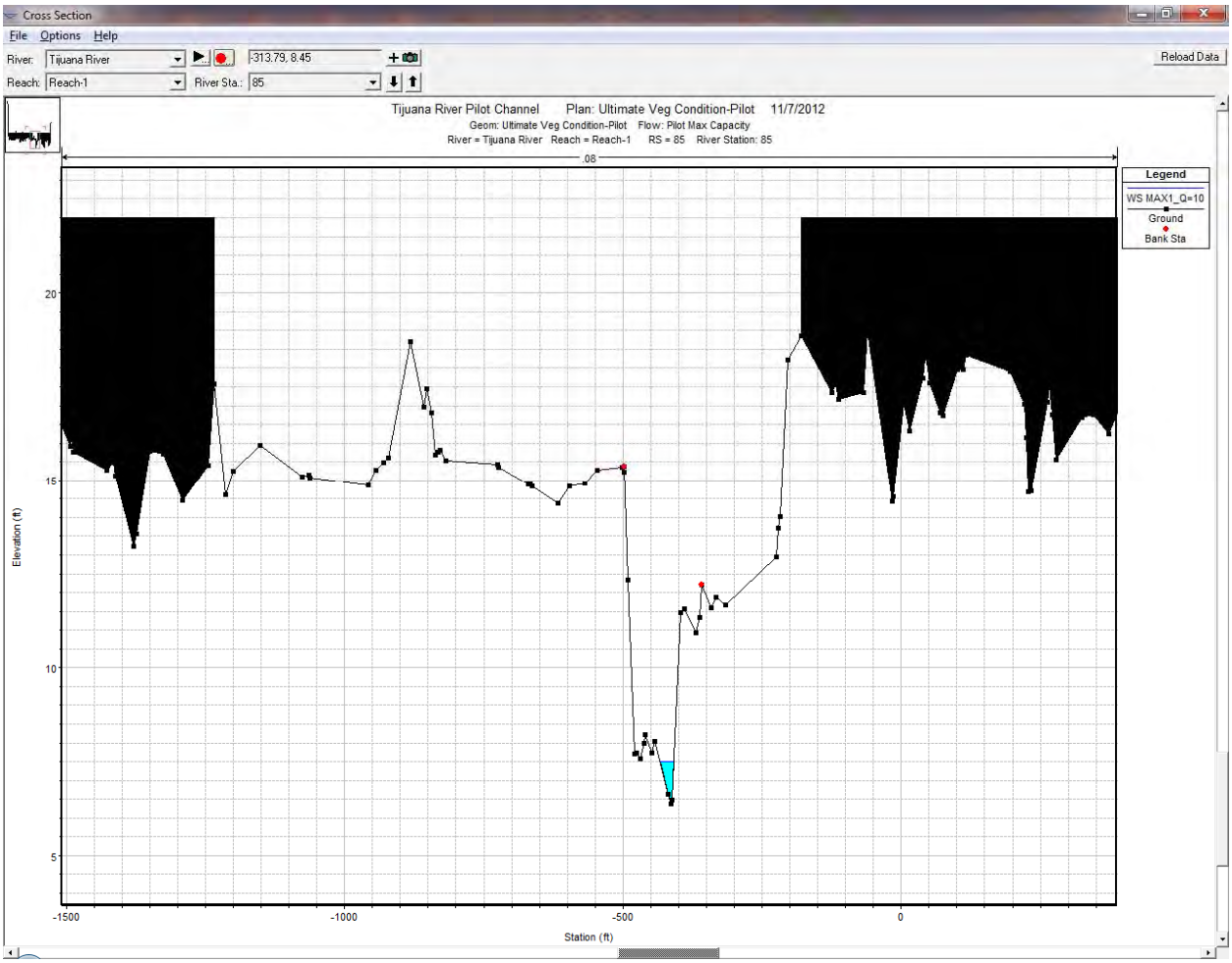

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 119
-1213.14, 15.52
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 119 River Station: 119
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
24
22
20
18
16
14
-1600
-1400
-1200
-1000
Station (ft)

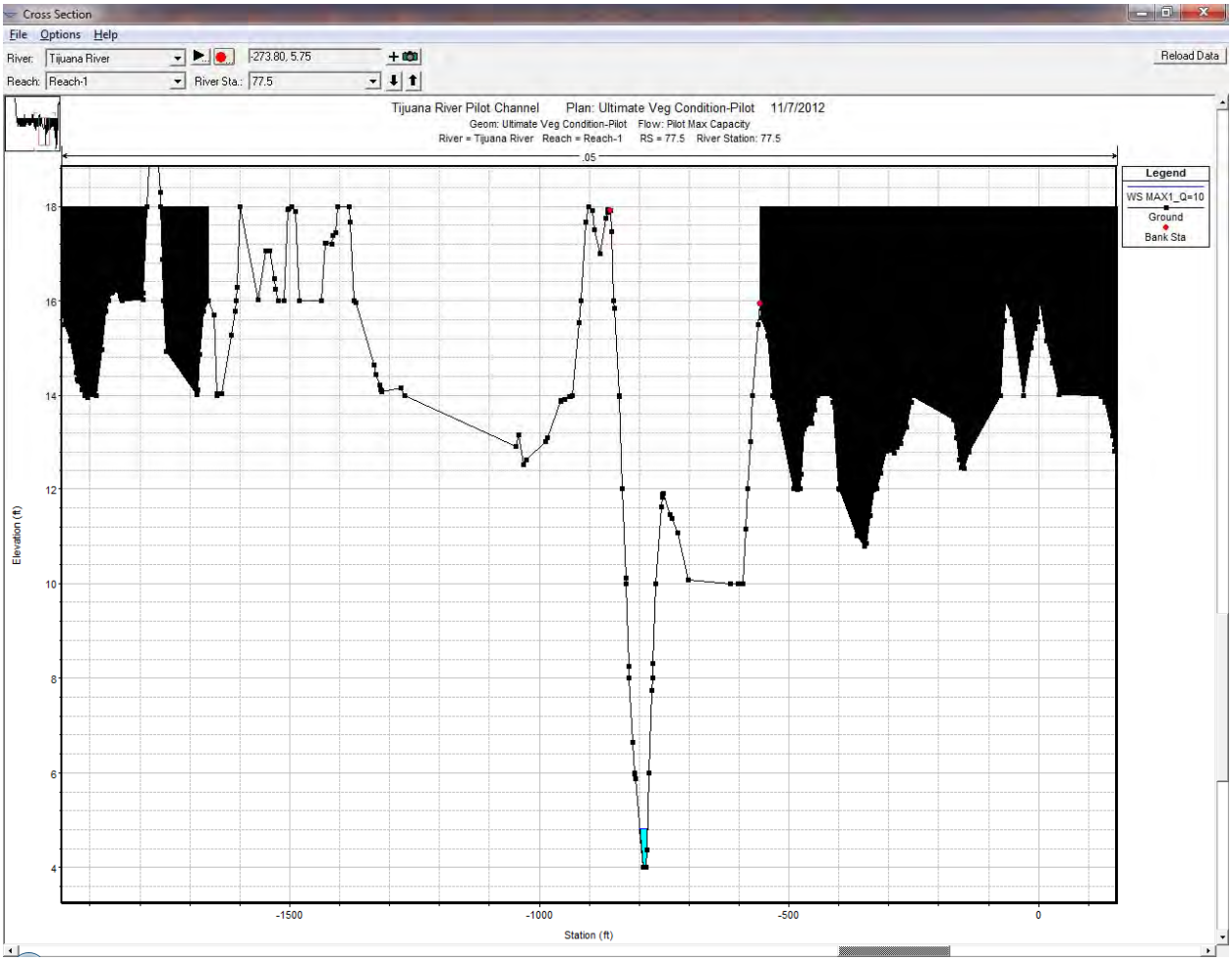

Cross Section
File Options Help
River: Tijuana River
-1991.66, 14.21
Reach: Reach-1
River Sta.: 108
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 108 River Station: 108
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)


Cross Section
File Options Help
River: Tijuana River
-1603.35, 14.71
Reach: Reach-1
River Sta.: 97.5
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 97.5 River Station: 97.5
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 93
-1355.32, 14.92
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 93 XSECTION AT D/S END OF PILOT CHANNEL
.08
.1
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
22
20
18
16
14
12
-1700
-1600
-1500
-1400
-1300
-1200
Station (ft)

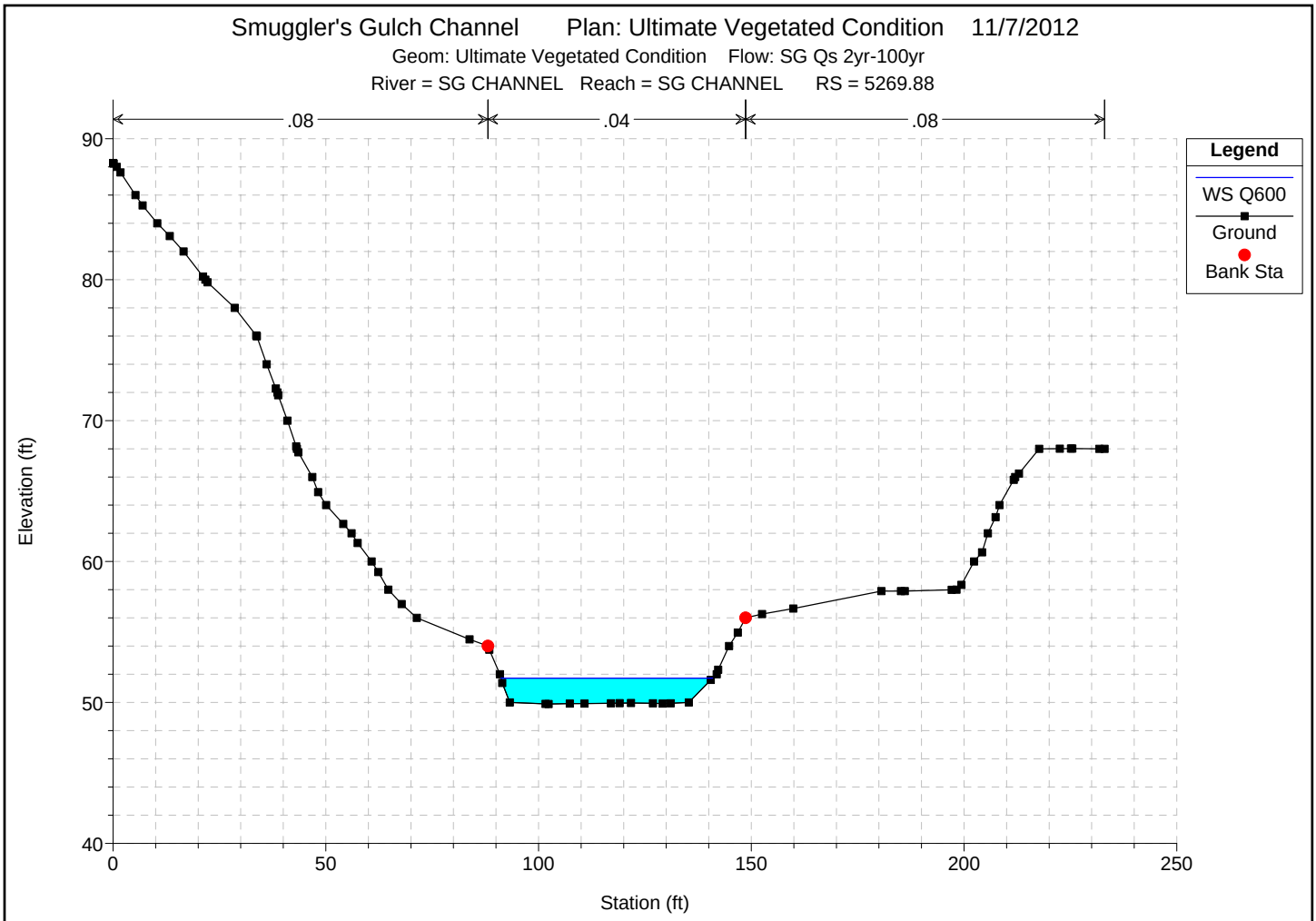

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 90
-376.06, 9.42
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 90 River Station: 90
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
25
20
15
10
-1500
-1000
-500
0
Station (ft)

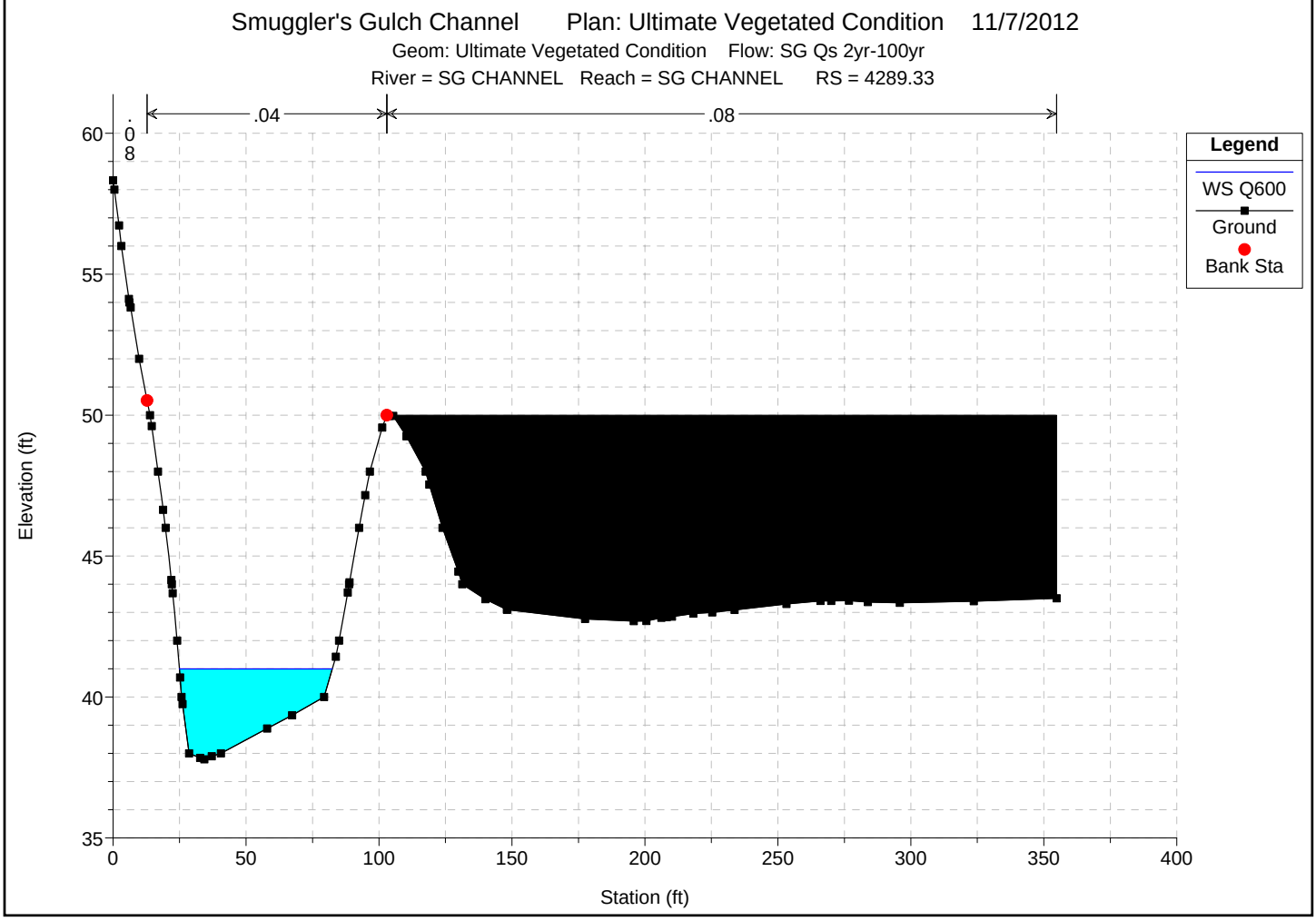

Cross Section
File Options Help
River: Tijuana River
-313.79, 8.45
Reach: Reach-1
River Sta.: 85
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 85 River Station: 85
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

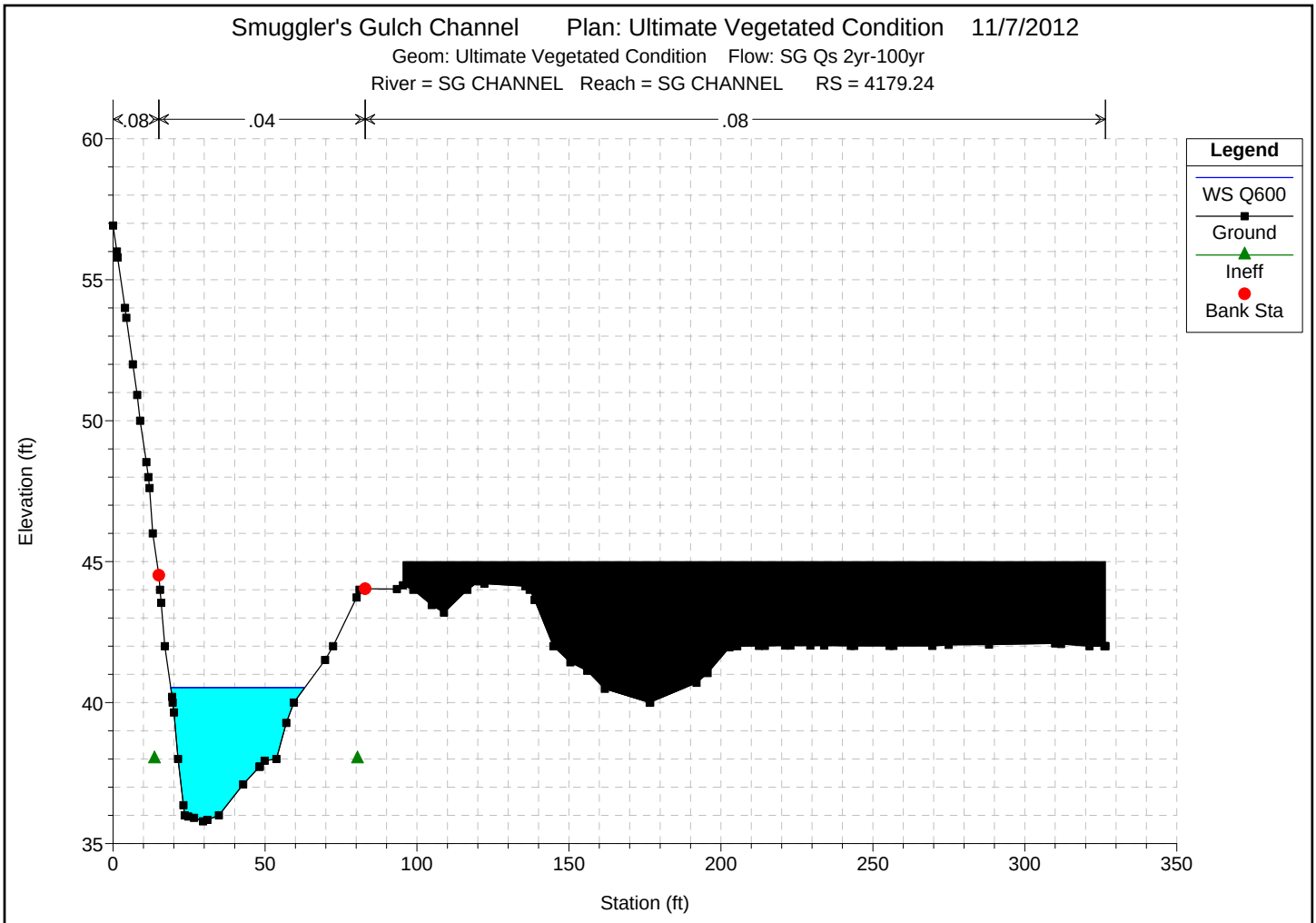

Cross Section
File Options Help
River: Tijuana River
-273.80, 5.75
Reach: Reach-1
River Sta.: 77.5
Reload Data
Tijuana River Pilot Channel Plan: Ultimate Veg Condition-Pilot 11/7/2012
Geom: Ultimate Veg Condition-Pilot Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 77.5 River Station: 77.5
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

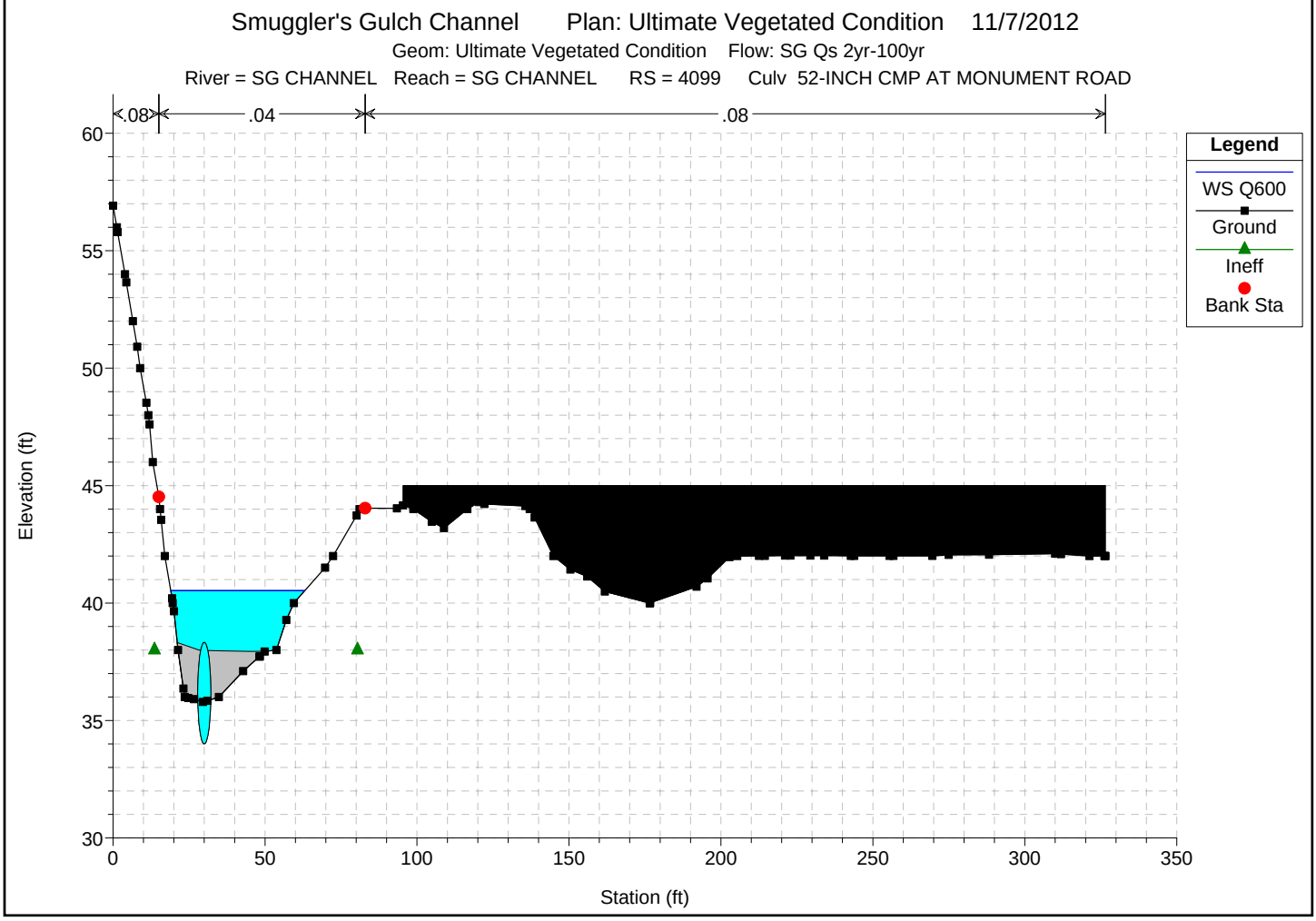
HEC-RAS Plan: UltimateVegeCnd River: SG CHANNEL Reach: SG CHANNEL Profile: Q600

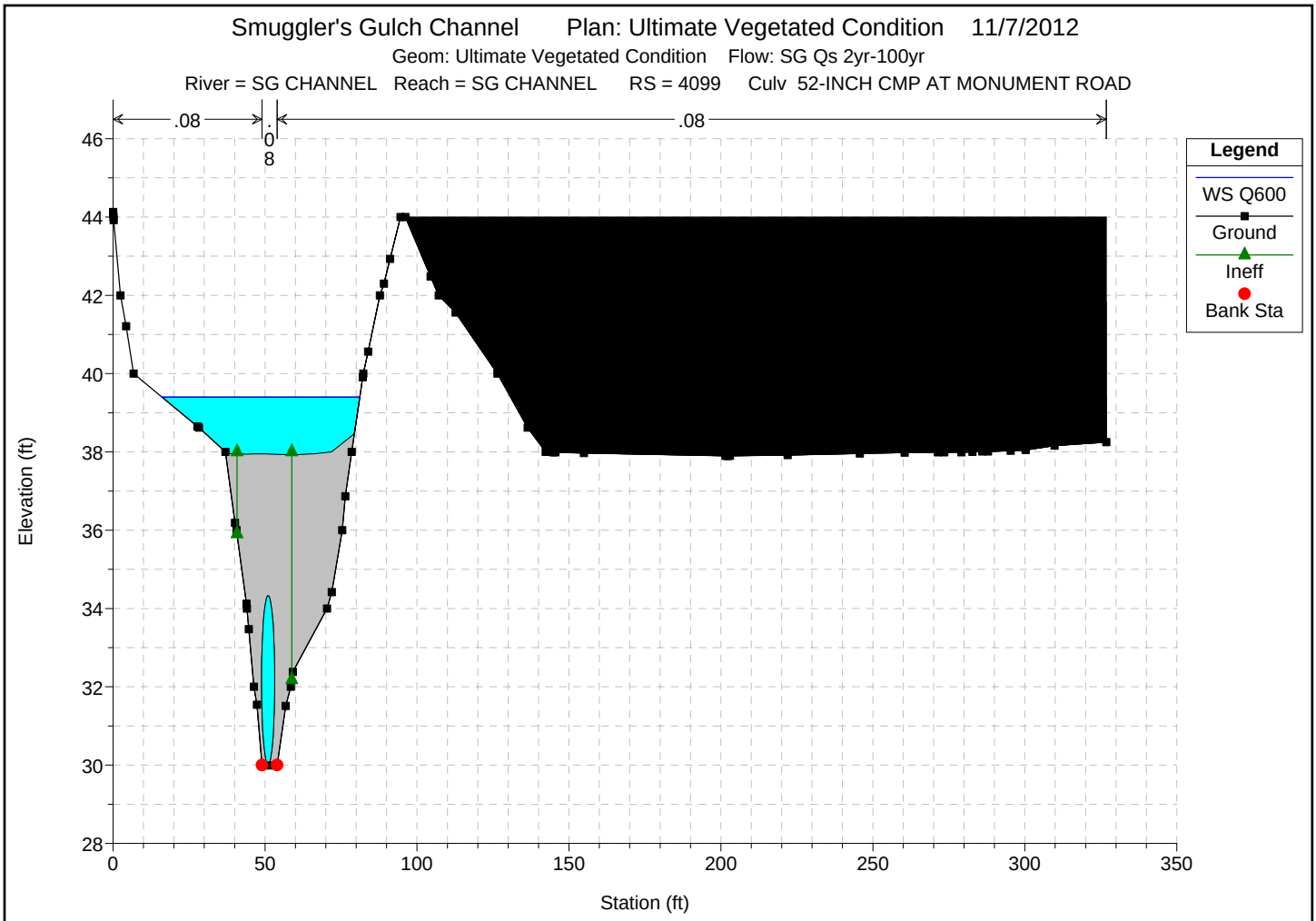
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
SG CHANNEL	5269.88	Q600	600.00	49.89	51.72	51.72	52.56	0.020523	7.33	81.86	49.76	1.01
SG CHANNEL	4289.33	Q600	600.00	37.79	40.99	40.31	41.37	0.006520	4.89	122.59	57.50	0.59
SG CHANNEL	4179.24	Q600	600.00	35.79	40.53	38.96	40.84	0.003456	4.44	135.01	44.10	0.45
SG CHANNEL	4099		Culvert									
SG CHANNEL	4028.11	Q600	600.00	29.99	35.75	35.04	37.03	0.030967	10.49	71.72	33.79	0.77
SG CHANNEL	4011.72	Q600	600.00	29.98	36.19	32.67	36.35	0.003116	3.50	197.53	41.36	0.25
SG CHANNEL	3863.17	Q600	600.00	29.87	35.94	31.82	36.01	0.001374	2.27	290.09	61.57	0.16
SG CHANNEL	3774.45	Q600	600.00	29.80	35.76	32.00	35.86	0.001983	2.69	251.43	61.66	0.20
SG CHANNEL	2623.27	Q600	600.00	25.73	34.30	28.52	34.36	0.000909	2.32	341.39	74.10	0.14
SG CHANNEL	2549.85	Q600	600.00	24.00	34.28	26.92	34.31	0.000383	1.72	456.63	69.54	0.09
SG CHANNEL	2500		Culvert									
SG CHANNEL	2489.75	Q600	600.00	24.00	32.06	26.12	32.12	0.000707	1.99	345.46	63.54	0.12
SG CHANNEL	2408.4	Q600	600.00	25.74	31.90	28.30	32.02	0.002334	2.97	243.03	61.55	0.21
SG CHANNEL	1551.01	Q600	600.00	22.00	25.14	25.14	26.39	0.055271	9.36	71.55	30.81	0.93

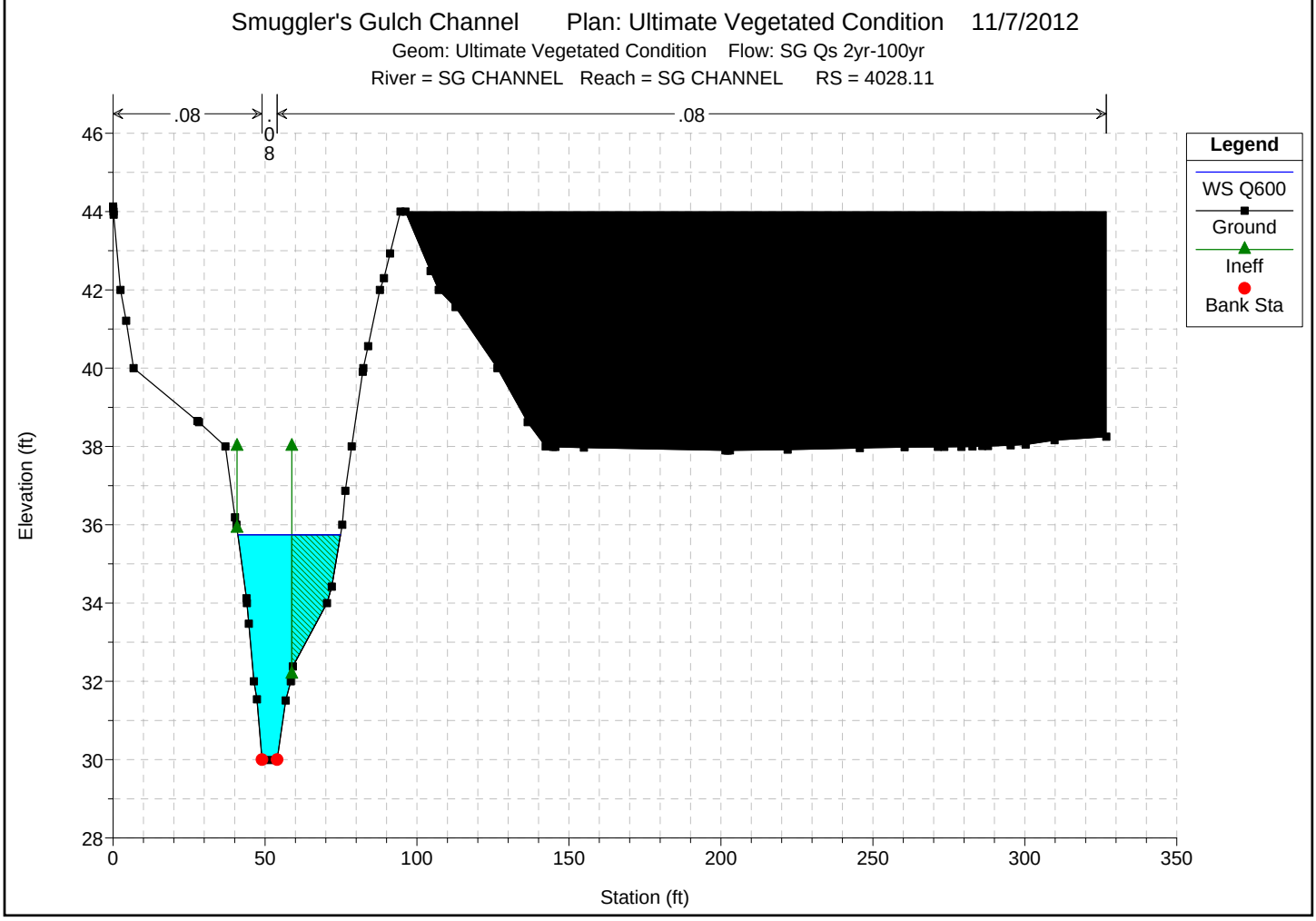

Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 5269.88
.08
.04
.08
Legend
WS Q600
Ground
Bank Sta
Elevation (ft)
Station (ft)
90
80
70
60
50
40
0
50
100
150
200
250

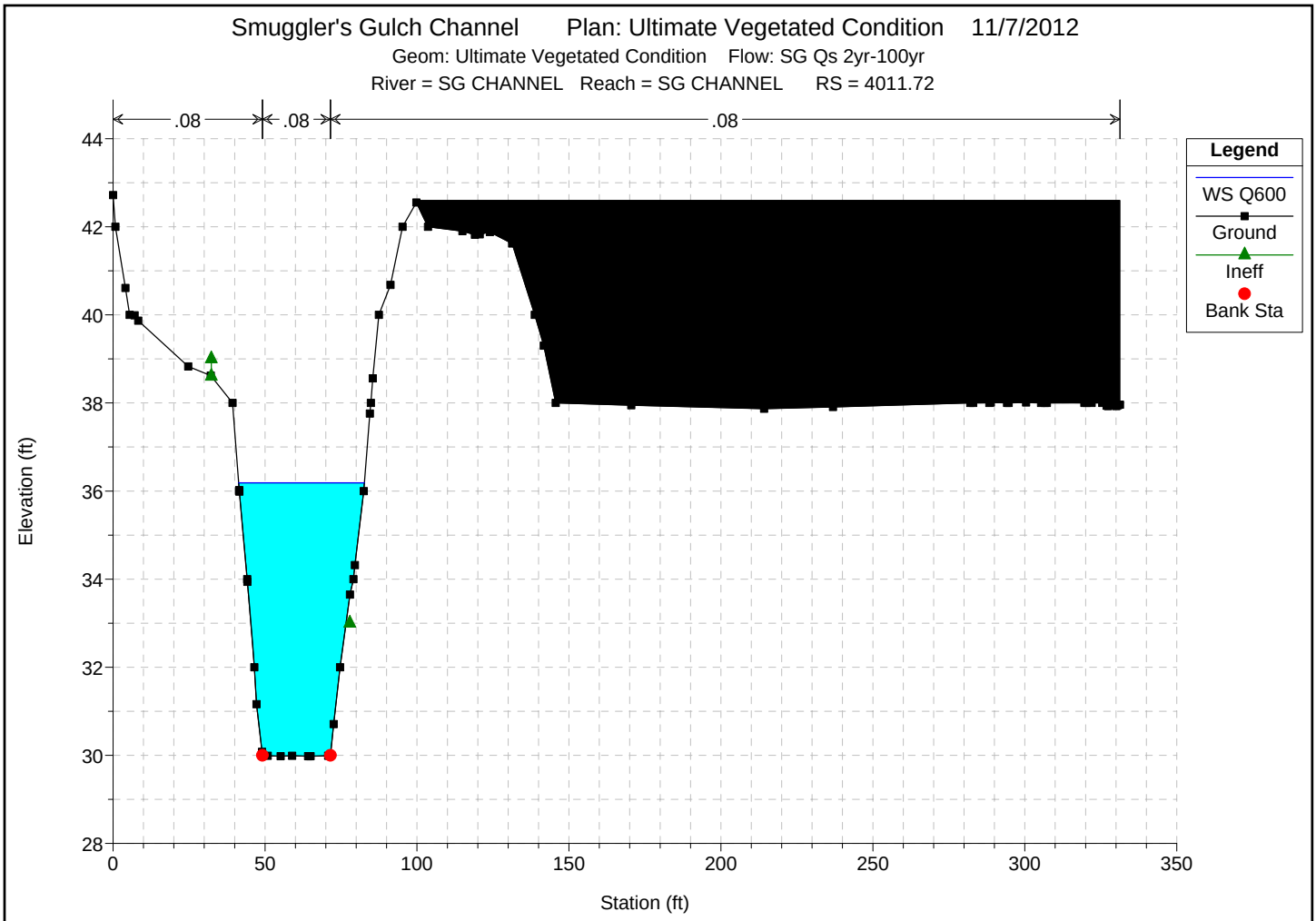

Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4289.33
.04
.08
Legend
WS Q600
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
55
50
45
40
35
0
50
100
150
200
250
300
350
400

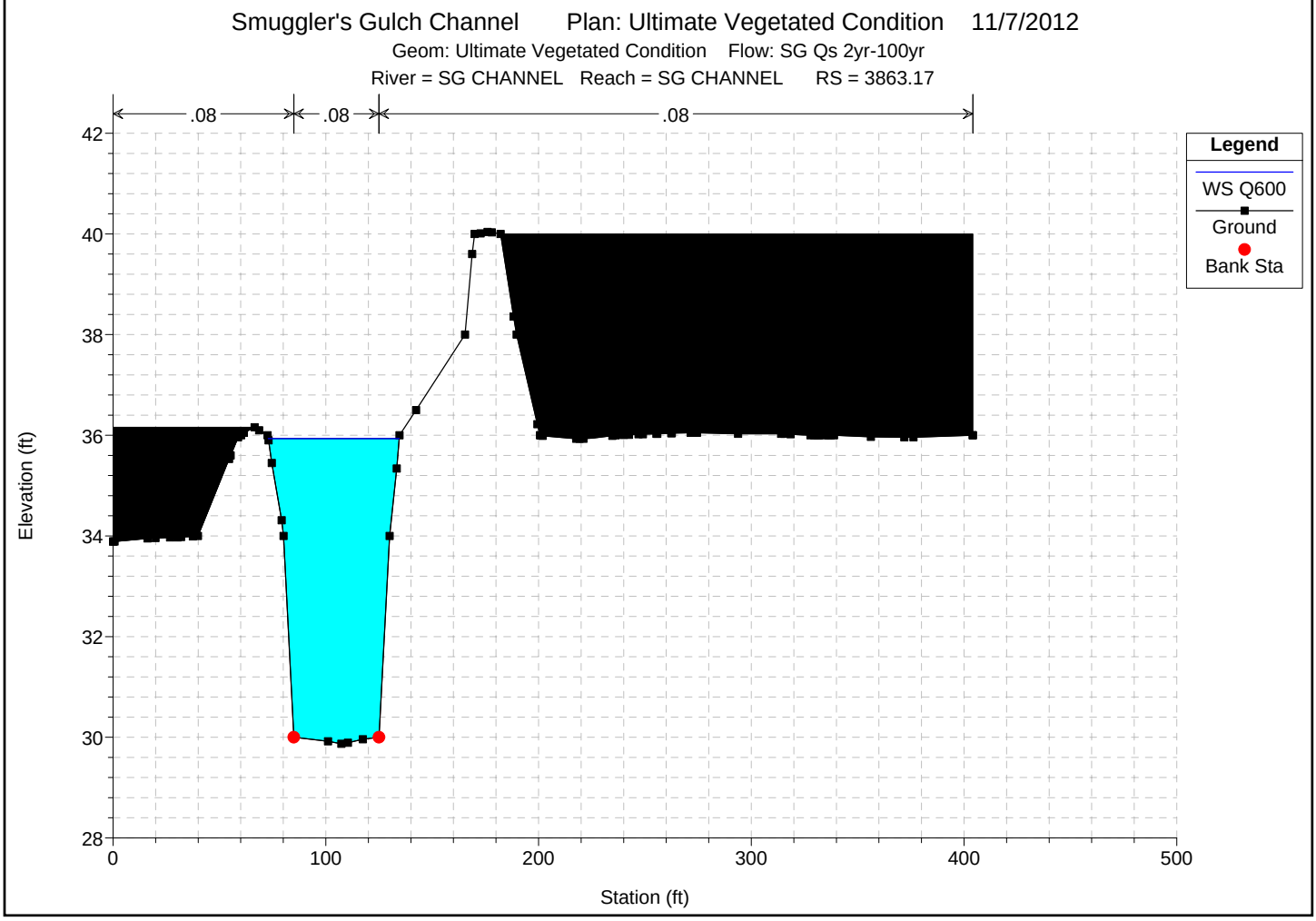

Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4179.24
.08
.04
.08
Legend
WS Q600
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
60
55
50
45
40
35
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4099 Culv 52-INCH CMP AT MONUMENT ROAD
.08
.04
.08
Legend
WS Q600
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
60
55
50
45
40
35
30
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4099 Culv 52-INCH CMP AT MONUMENT ROAD
.08
.08
.08
Legend
WS Q600
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
46
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4028.11
.08
.08
.08
Legend
WS Q600
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
46
0
50
100
150
200
250
300
350

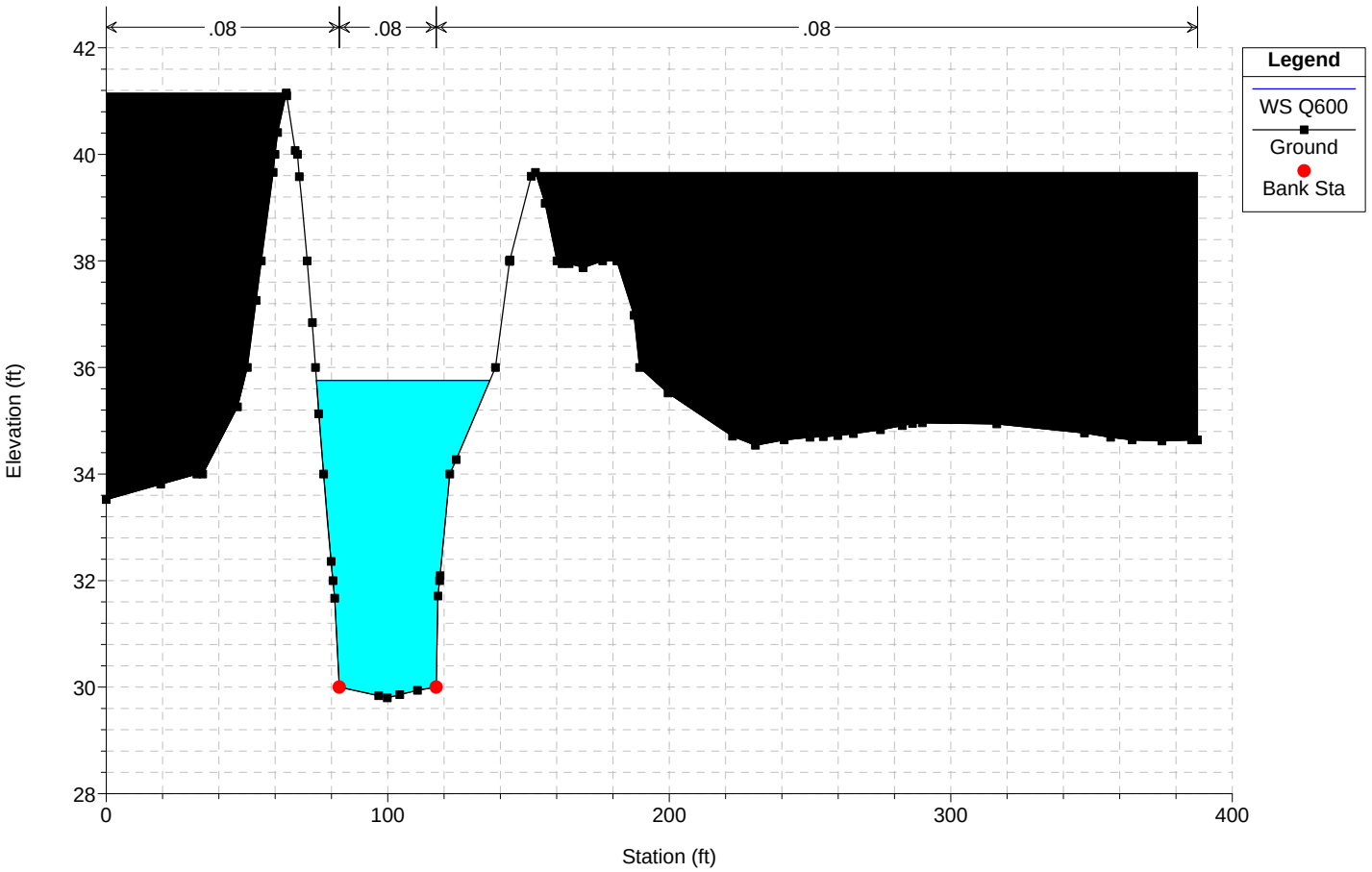

Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4011.72
.08
.08
.08
Legend
WS Q600
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012
Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 3863.17
.08
.08
.08
Legend
WS Q600
Ground
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
0
100
200
300
400
500

Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr

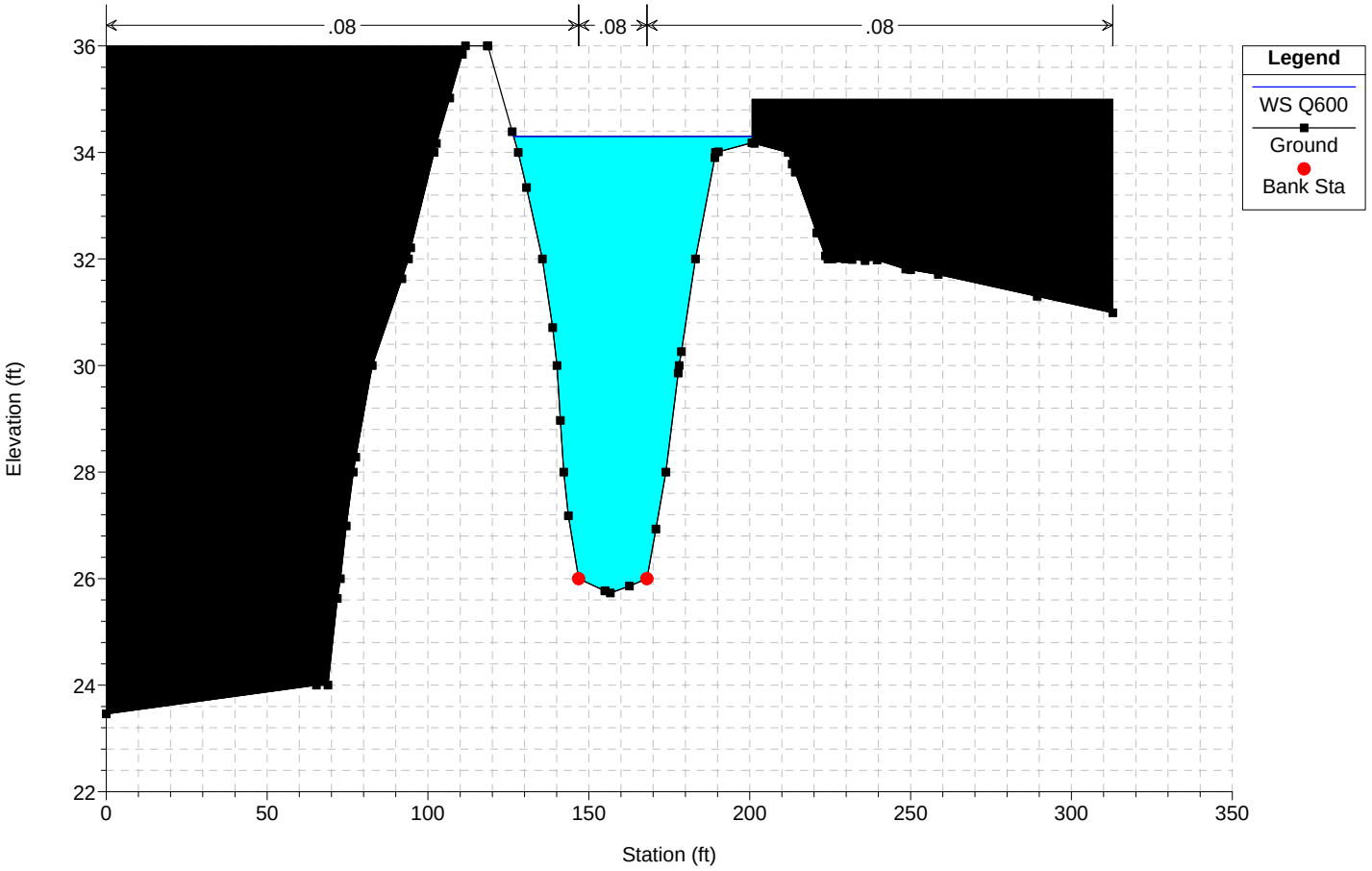
River = SG CHANNEL Reach = SG CHANNEL RS = 3774.45



Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr

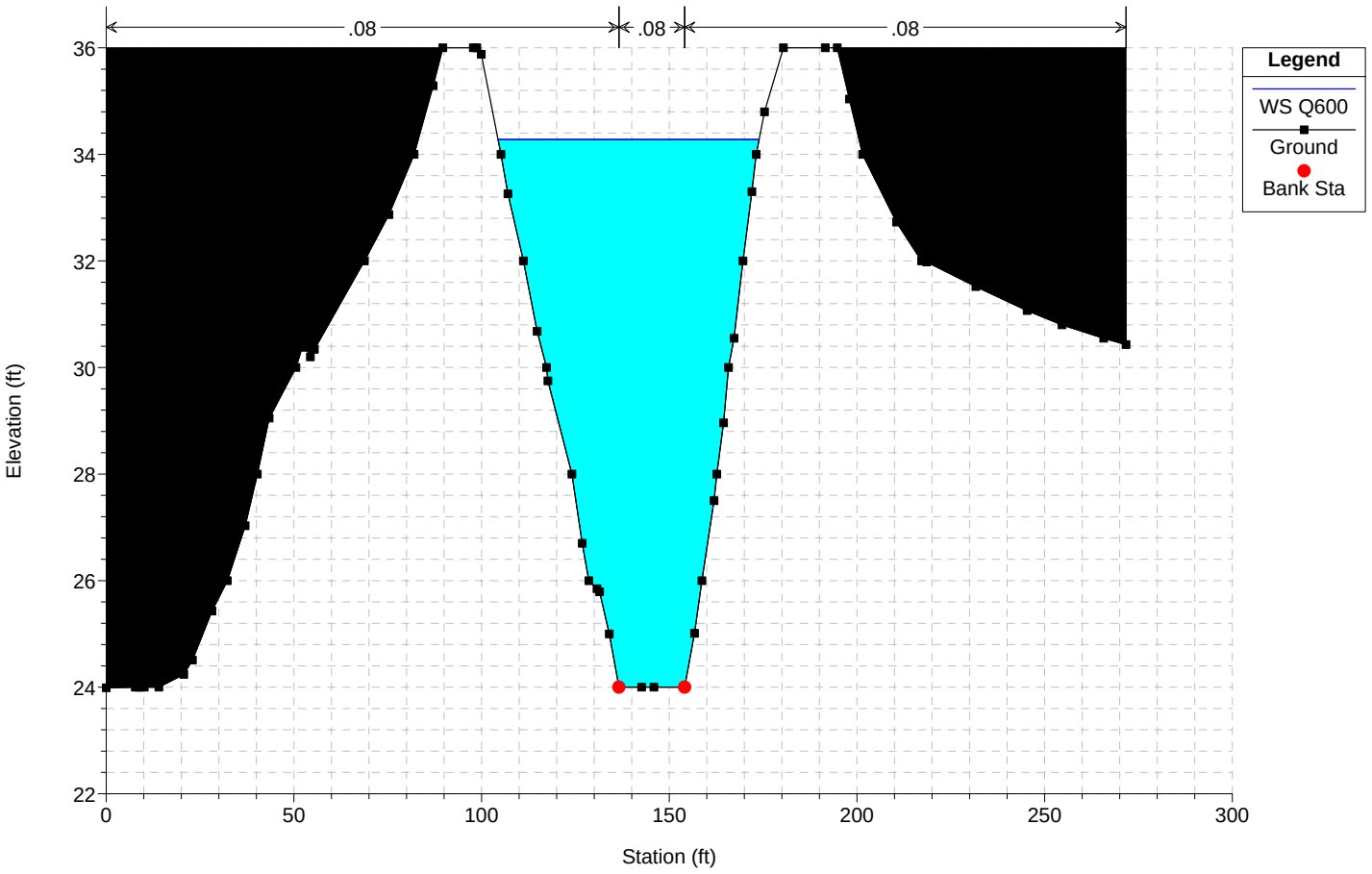
River = SG CHANNEL Reach = SG CHANNEL RS = 2623.27



Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr

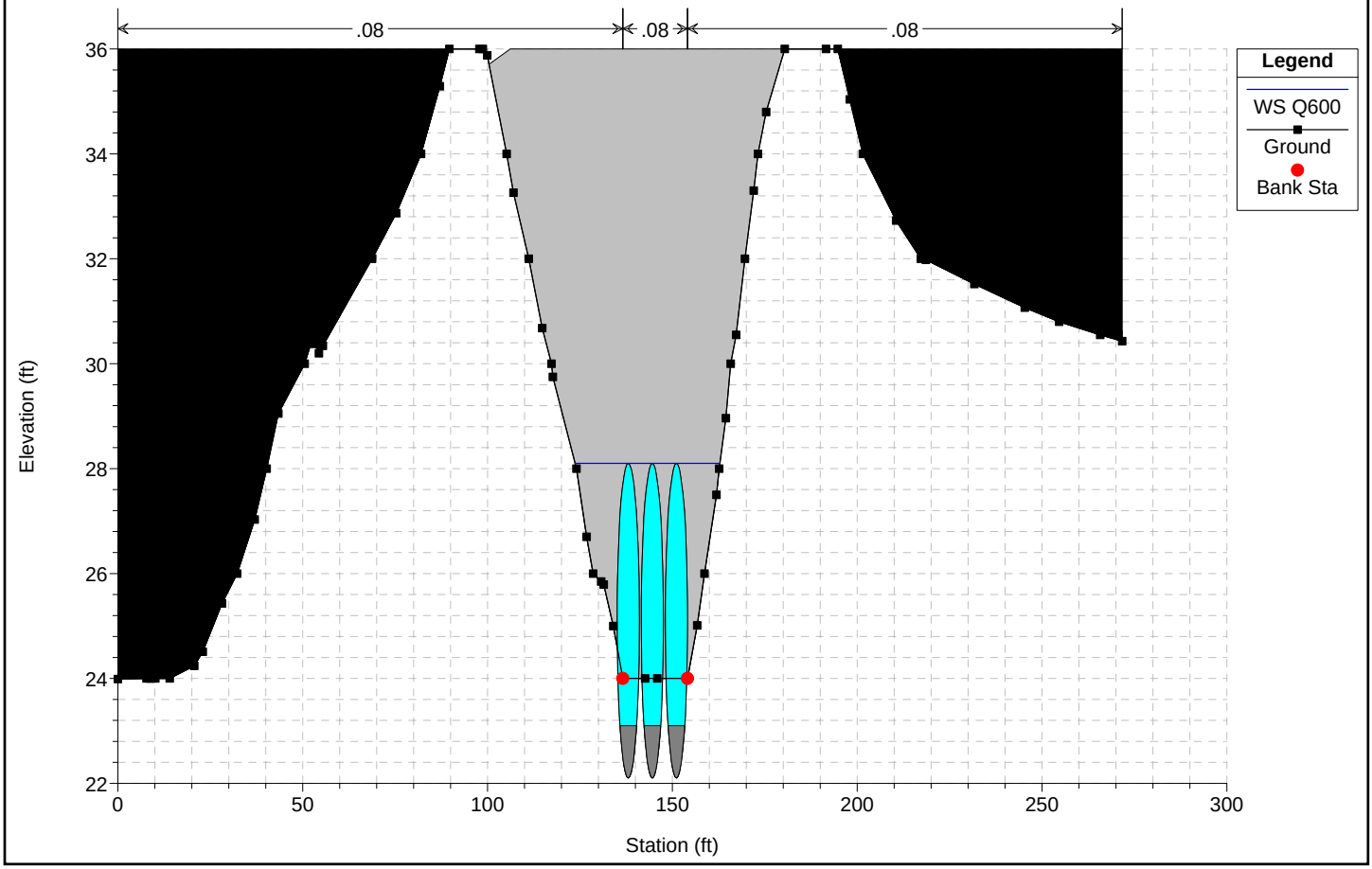
River = SG CHANNEL Reach = SG CHANNEL RS = 2549.85



Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr

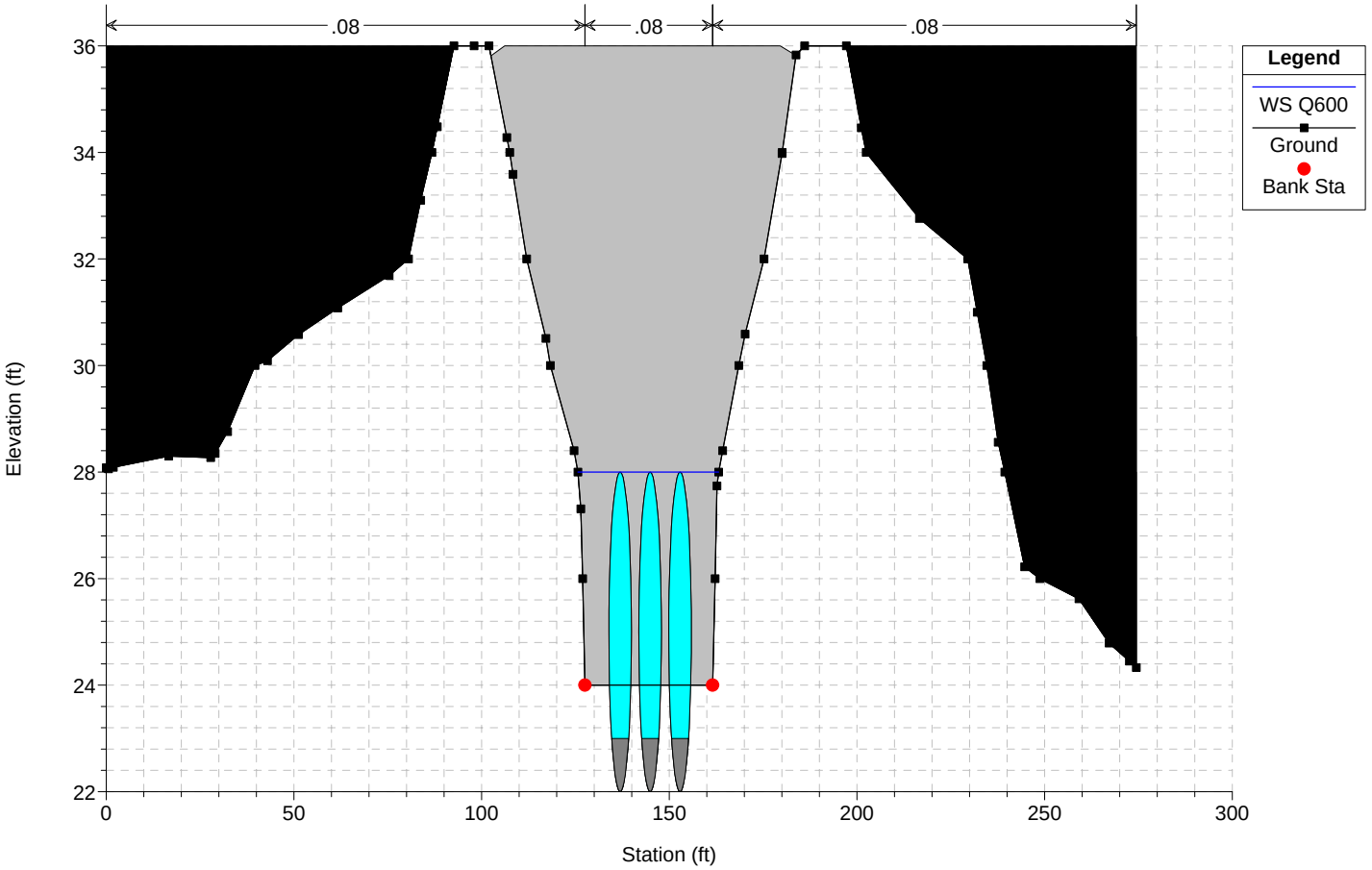
River = SG CHANNEL Reach = SG CHANNEL RS = 2500 Culv DISNEY CROSSING TRIPLE 72-INCH CMPs



Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr

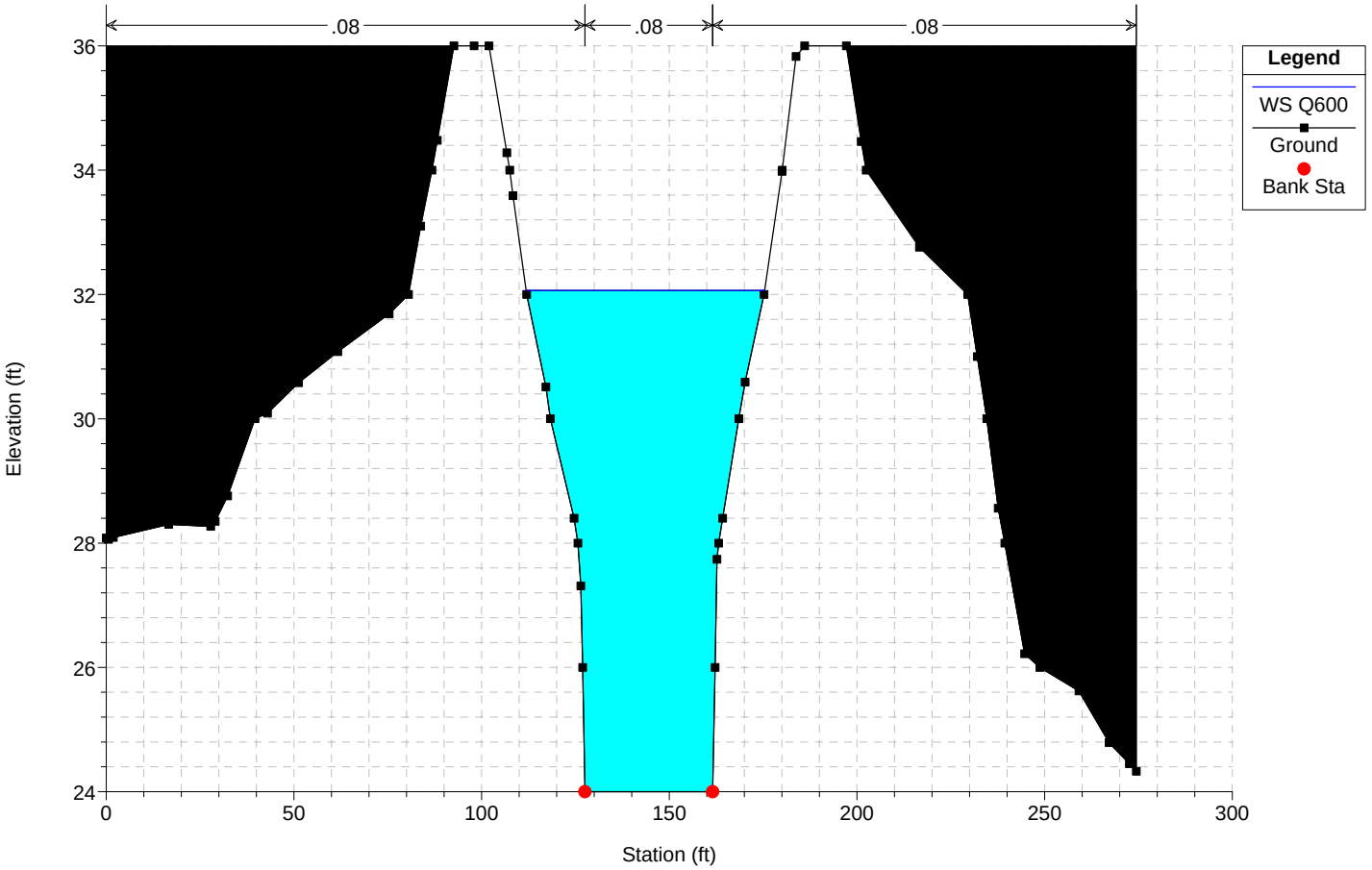
River = SG CHANNEL Reach = SG CHANNEL RS = 2500 Culv DISNEY CROSSING TRIPLE 72-INCH CMPs



Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr

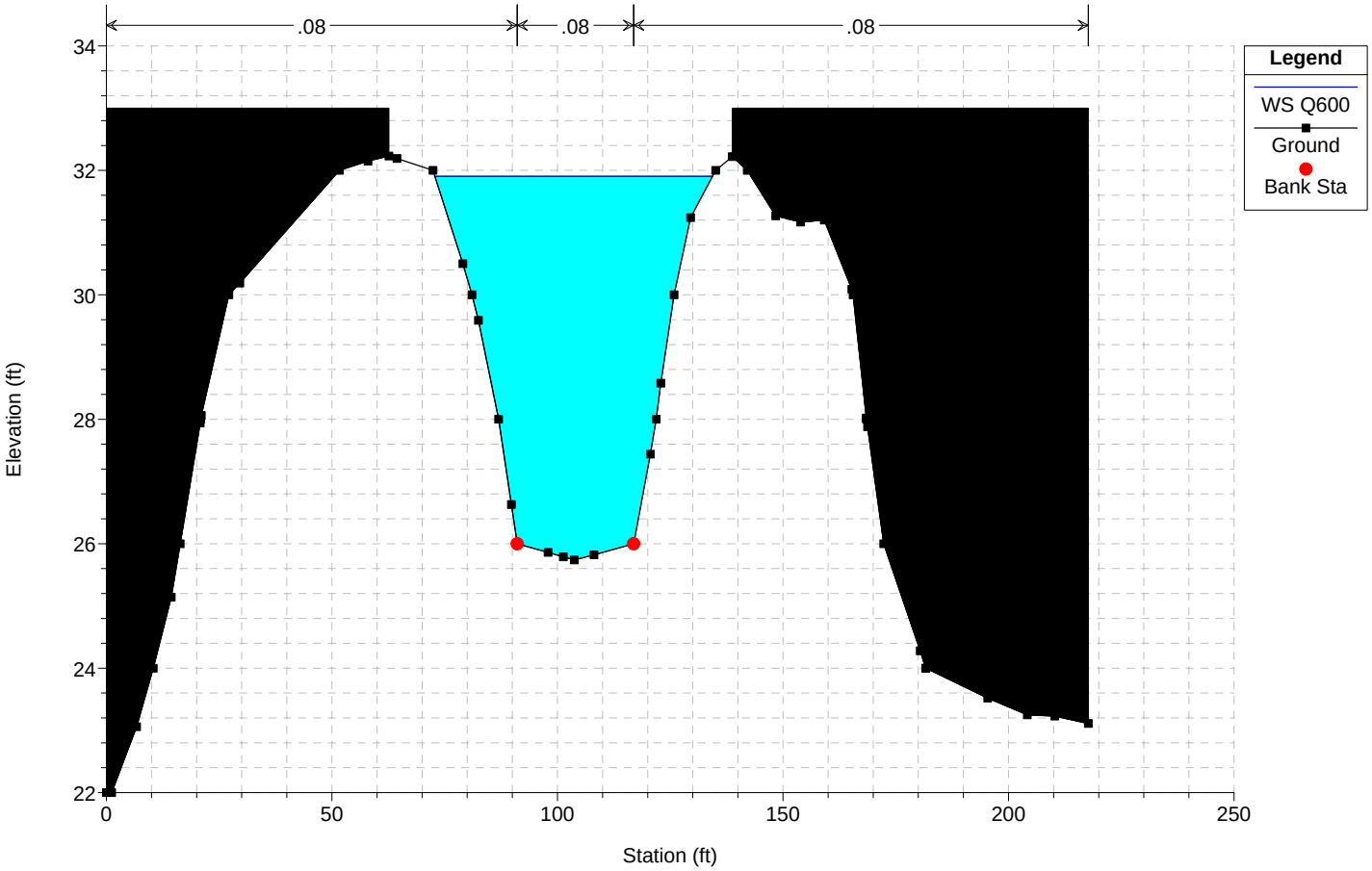
River = SG CHANNEL Reach = SG CHANNEL RS = 2489.75



Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr

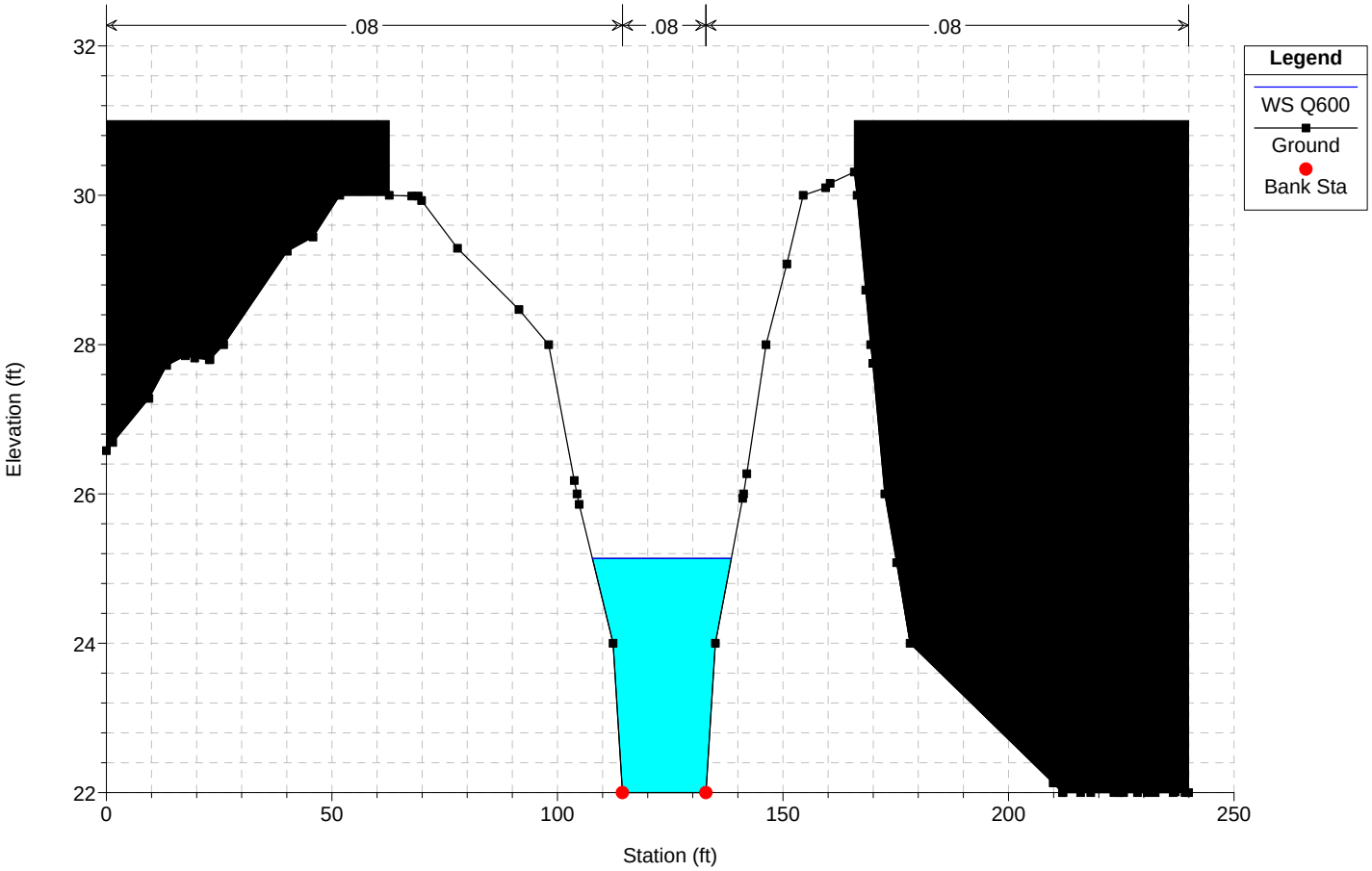
River = SG CHANNEL Reach = SG CHANNEL RS = 2408.4



Smuggler's Gulch Channel Plan: Ultimate Vegetated Condition 11/7/2012

Geom: Ultimate Vegetated Condition Flow: SG Qs 2yr-100yr

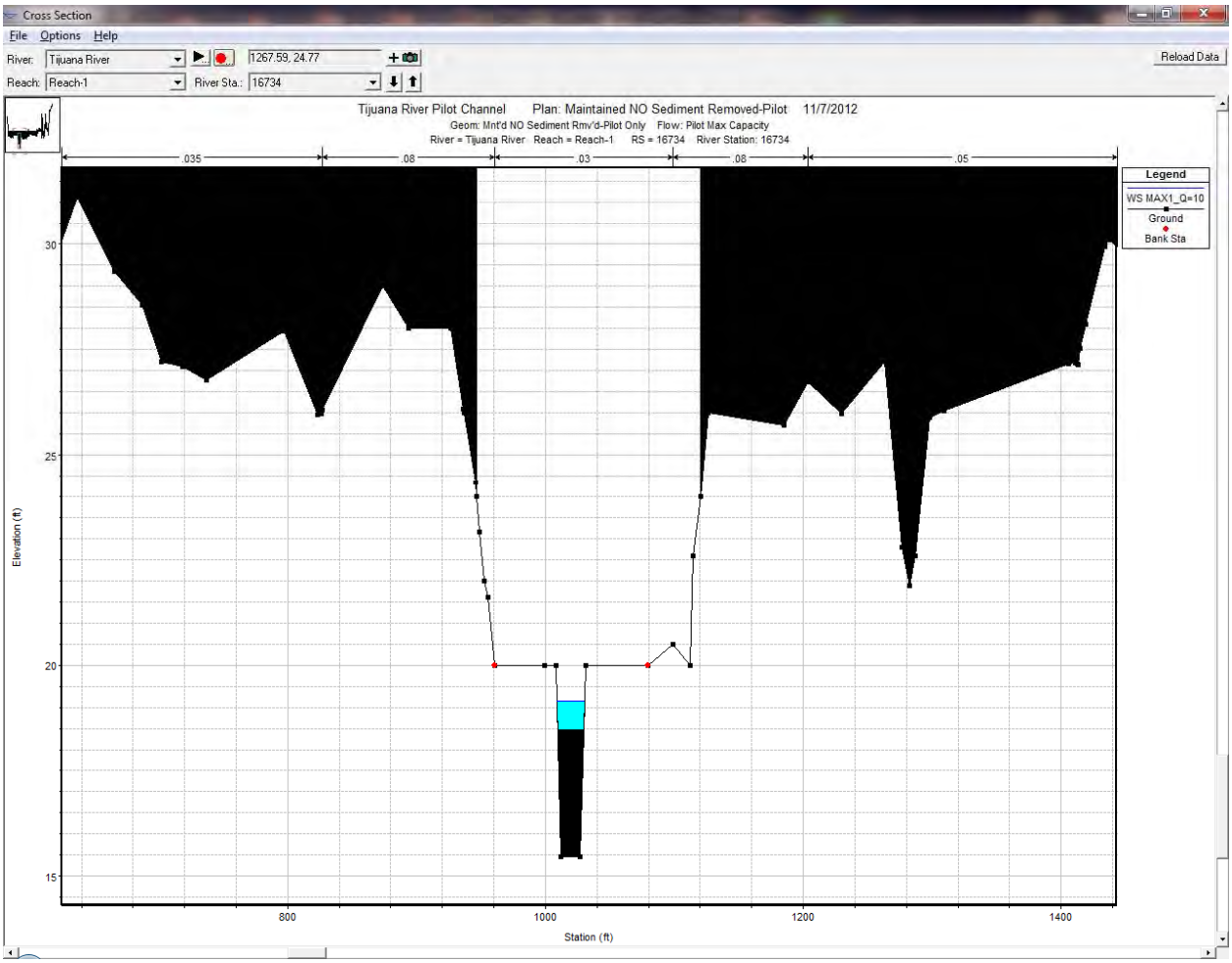
River = SG CHANNEL Reach = SG CHANNEL RS = 1551.01

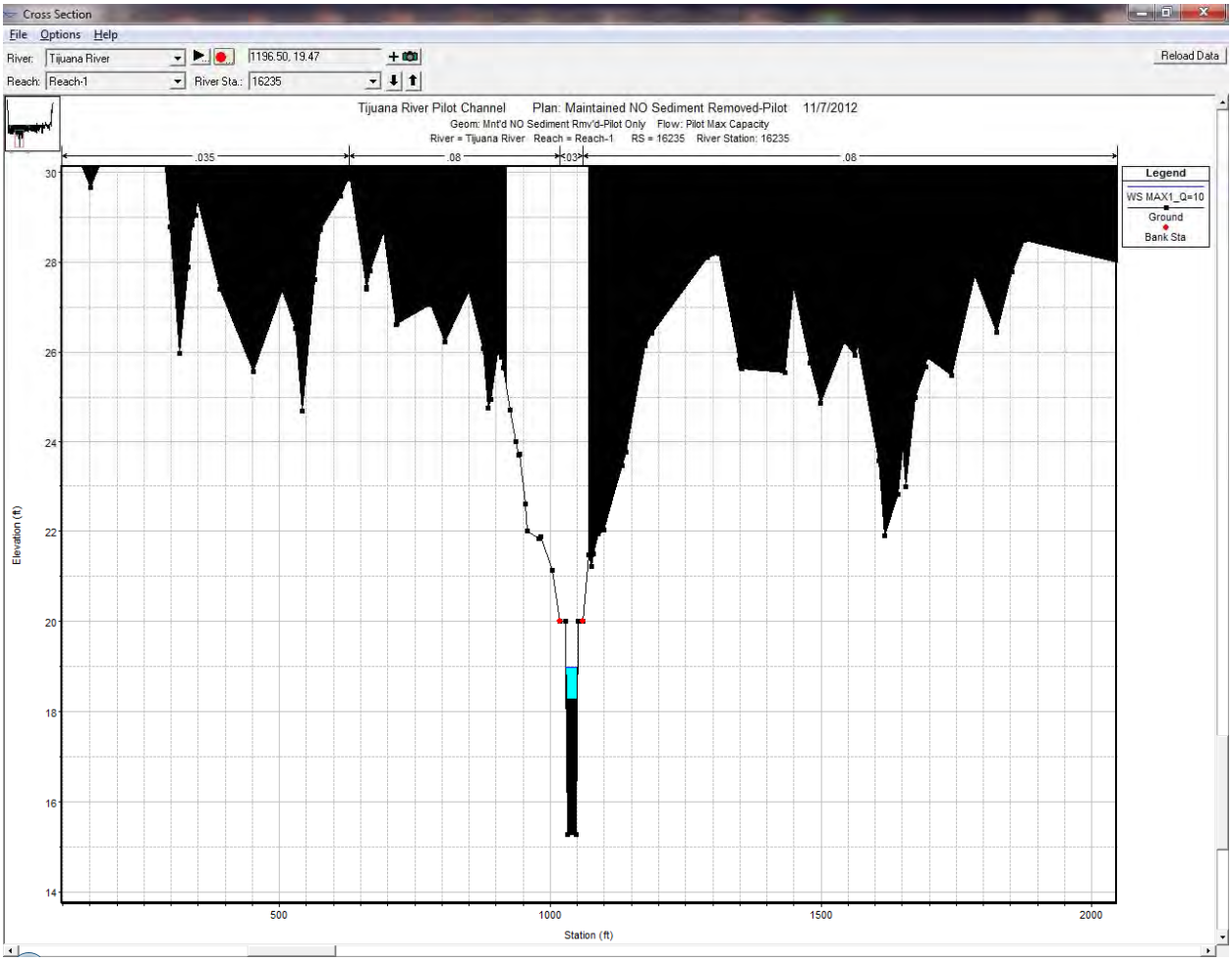


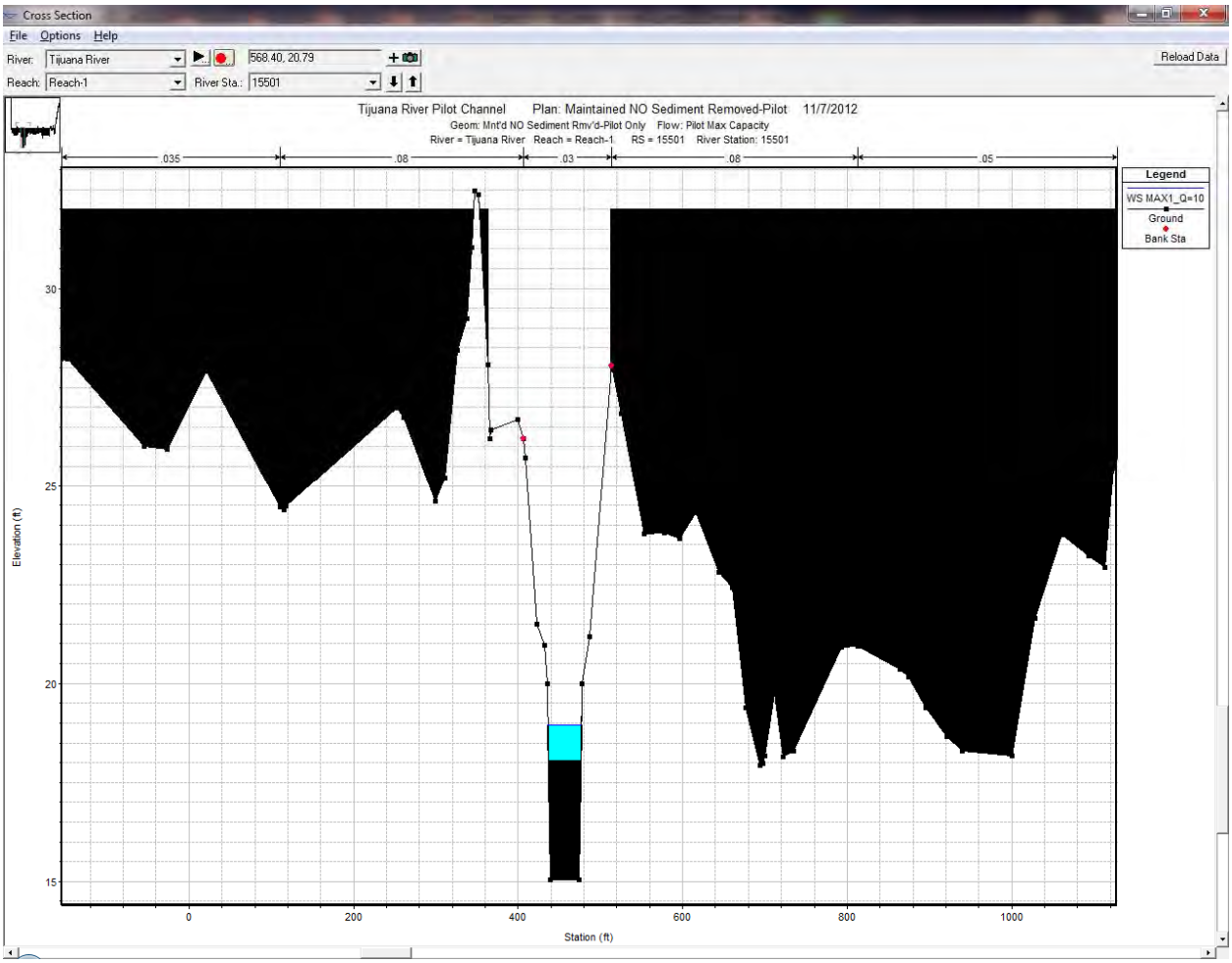
DETAILED HYDRAULIC RESULTS FOR MAINTAINED CONDITION MODEL (NO SEDIMENT REMOVED)

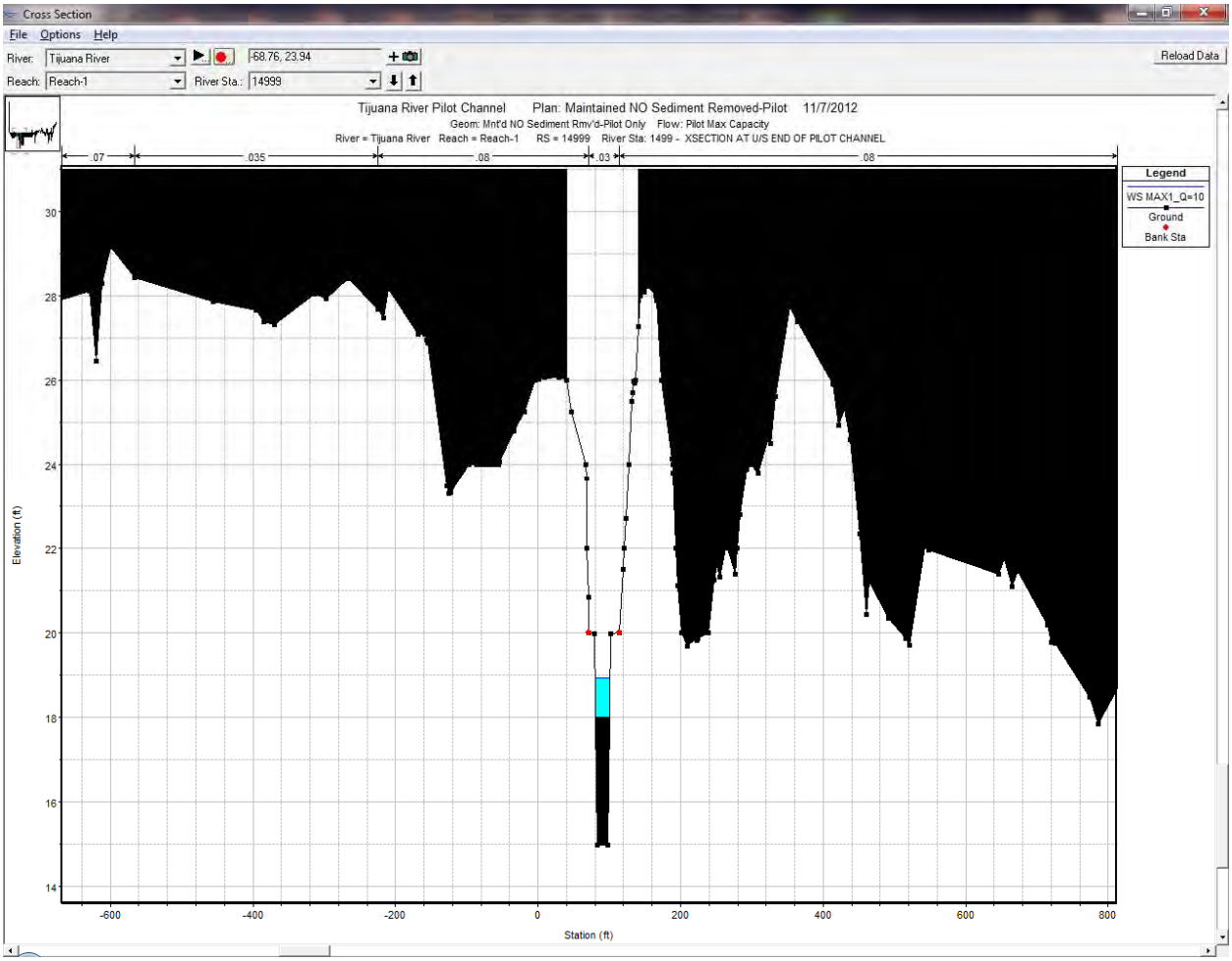
HEC-RAS Plan: MntdNoSedRemPilo River: Tijuana River Reach: Reach-1 Profile: MAX1_Q=10

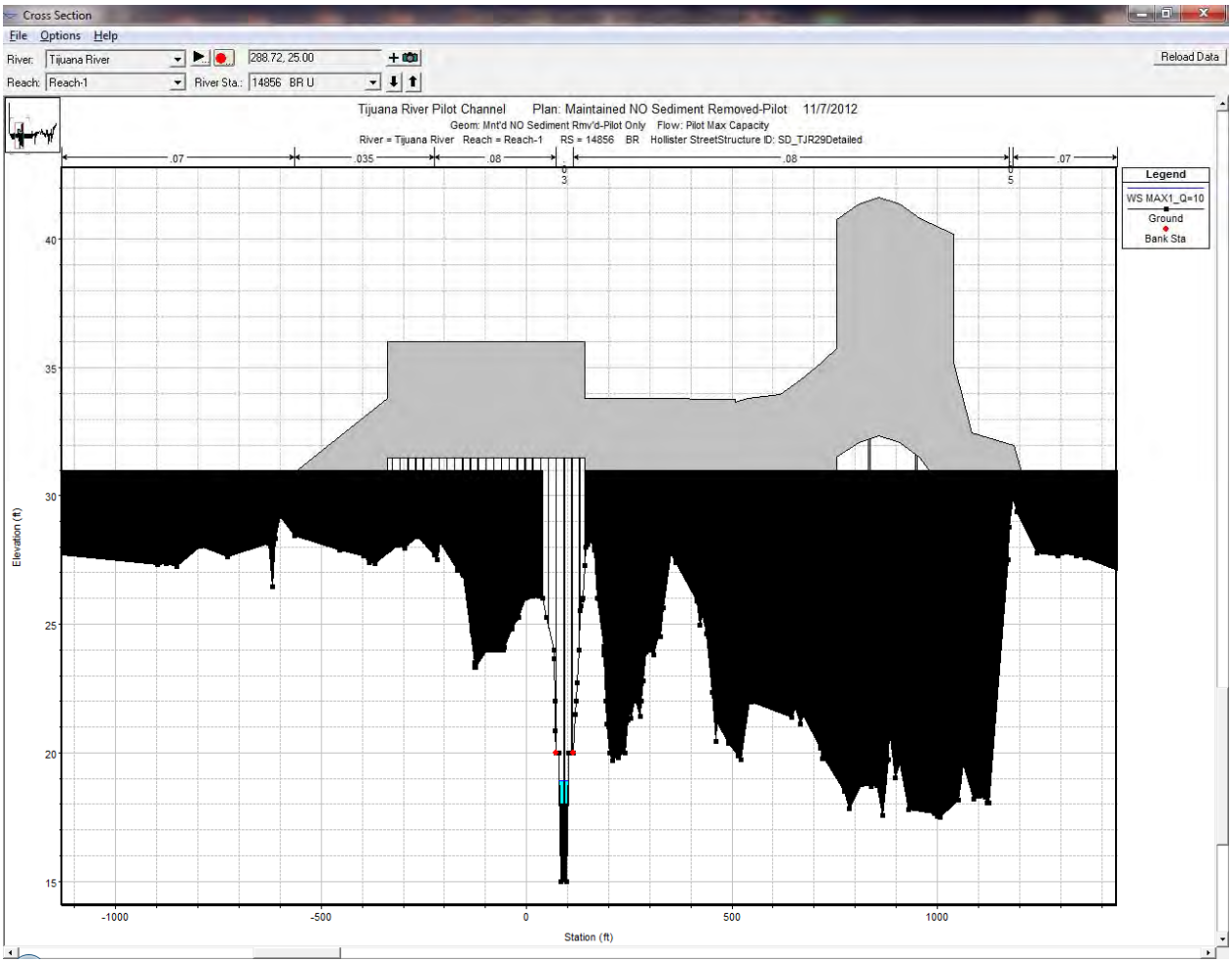
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	16734	MAX1_Q=10	10.00	18.46	19.15	18.66	19.16	0.000345	0.69	14.45	21.50	0.15
Reach-1	16235	MAX1_Q=10	10.00	18.27	18.99	18.47	19.00	0.000307	0.67	14.93	21.34	0.14
Reach-1	15501	MAX1_Q=10	10.00	18.05	18.95	18.17	18.95	0.000038	0.28	36.16	40.98	0.05
Reach-1	14999	MAX1_Q=10	10.00	18.00	18.94	18.20	18.94	0.000134	0.52	19.23	21.31	0.10
Reach-1	14856		Bridge									
Reach-1	14688	MAX1_Q=10	10.00	17.90	18.90	18.10	18.91	0.000107	0.49	20.61	21.36	0.09
Reach-1	14541	MAX1_Q=10	10.00	17.85	18.89	18.05	18.89	0.000094	0.47	21.43	21.45	0.08
Reach-1	13805	MAX1_Q=10	10.00	17.68	18.85	17.88	18.86	0.000070	0.43	23.24	20.58	0.07
Reach-1	134.5	MAX1_Q=10	10.00	17.48	18.82	17.70	18.82	0.000057	0.42	23.93	18.35	0.06
Reach-1	127.5	MAX1_Q=10	10.00	17.20	18.80	17.40	18.80	0.000023	0.30	33.70	22.36	0.04
Reach-1	122	MAX1_Q=10	10.00	17.00	18.79	17.20	18.79	0.000016	0.26	38.05	22.72	0.04
Reach-1	120	MAX1_Q=10	10.00	16.91	18.79	17.11	18.79	0.000013	0.25	39.95	22.80	0.03
Reach-1	119	MAX1_Q=10	10.00	16.92	18.78	17.12	18.79	0.000014	0.25	39.69	22.78	0.03
Reach-1	108	MAX1_Q=10	10.00	18.04	18.74	18.22	18.75	0.000495	0.63	15.88	23.00	0.13
Reach-1	97.5	MAX1_Q=10	10.00	17.60	18.22	17.78	18.22	0.000423	0.72	13.96	23.00	0.16
Reach-1	93	MAX1_Q=10	10.00	17.43	17.70	17.61	17.74	0.006969	1.68	5.94	22.62	0.58
Reach-1	90	MAX1_Q=10	10.00	9.77	10.44	10.16	10.46	0.010105	0.96	10.40	28.12	0.28
Reach-1	85	MAX1_Q=10	10.00	6.39	7.50	6.87	7.51	0.002555	0.67	14.92	24.54	0.15
Reach-1	77.5	MAX1_Q=10	10.00	4.00	4.81	4.41	4.84	0.003704	1.20	8.30	15.12	0.29

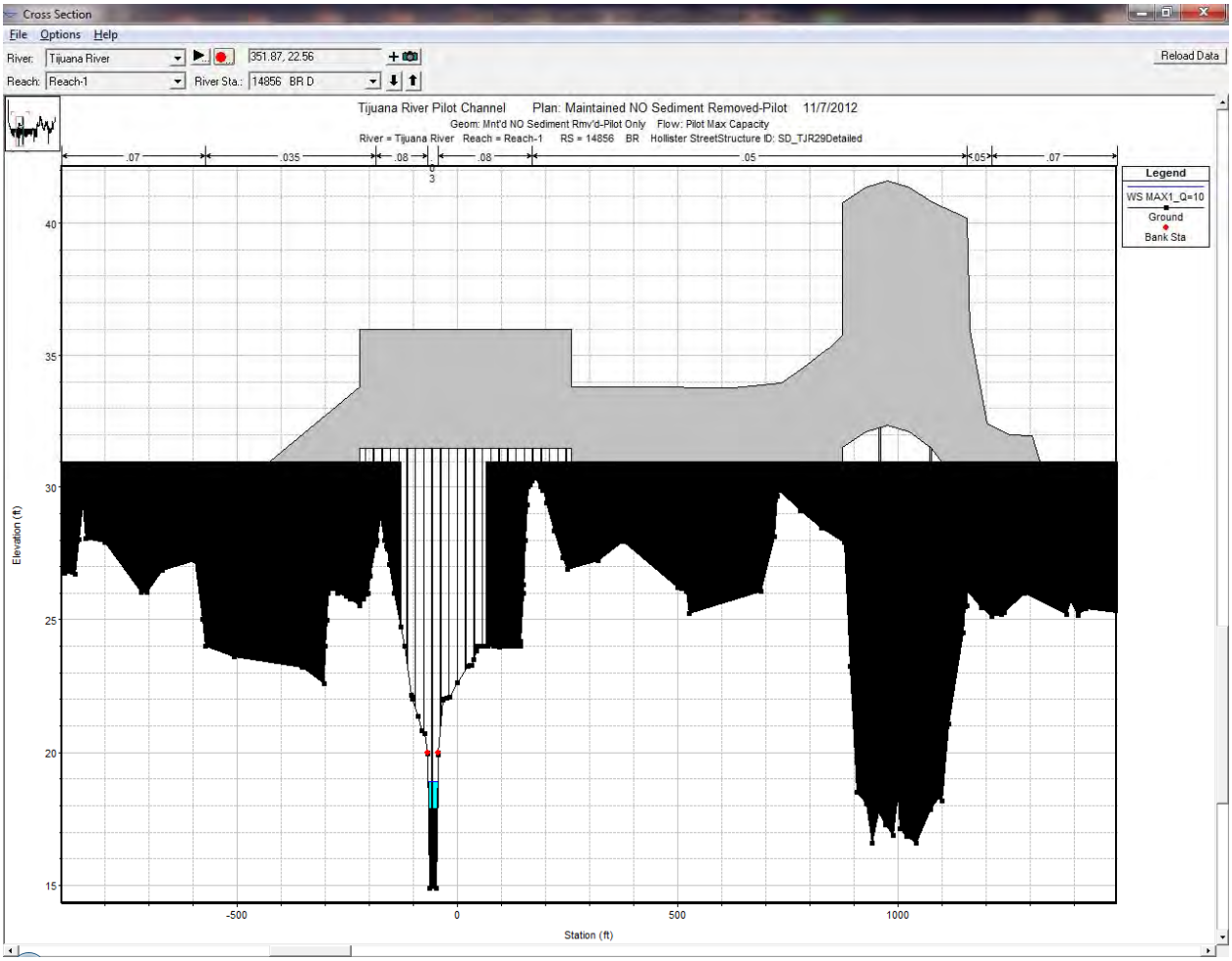

Cross Section
File Options Help
River: Tijuana River
1267.59, 24.77
Reach: Reach-1
River Sta.: 16734
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 16734 River Station: 16734
.035
.08
.03
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
30
25
20
15
800
1000
1200
1400
Station (ft)

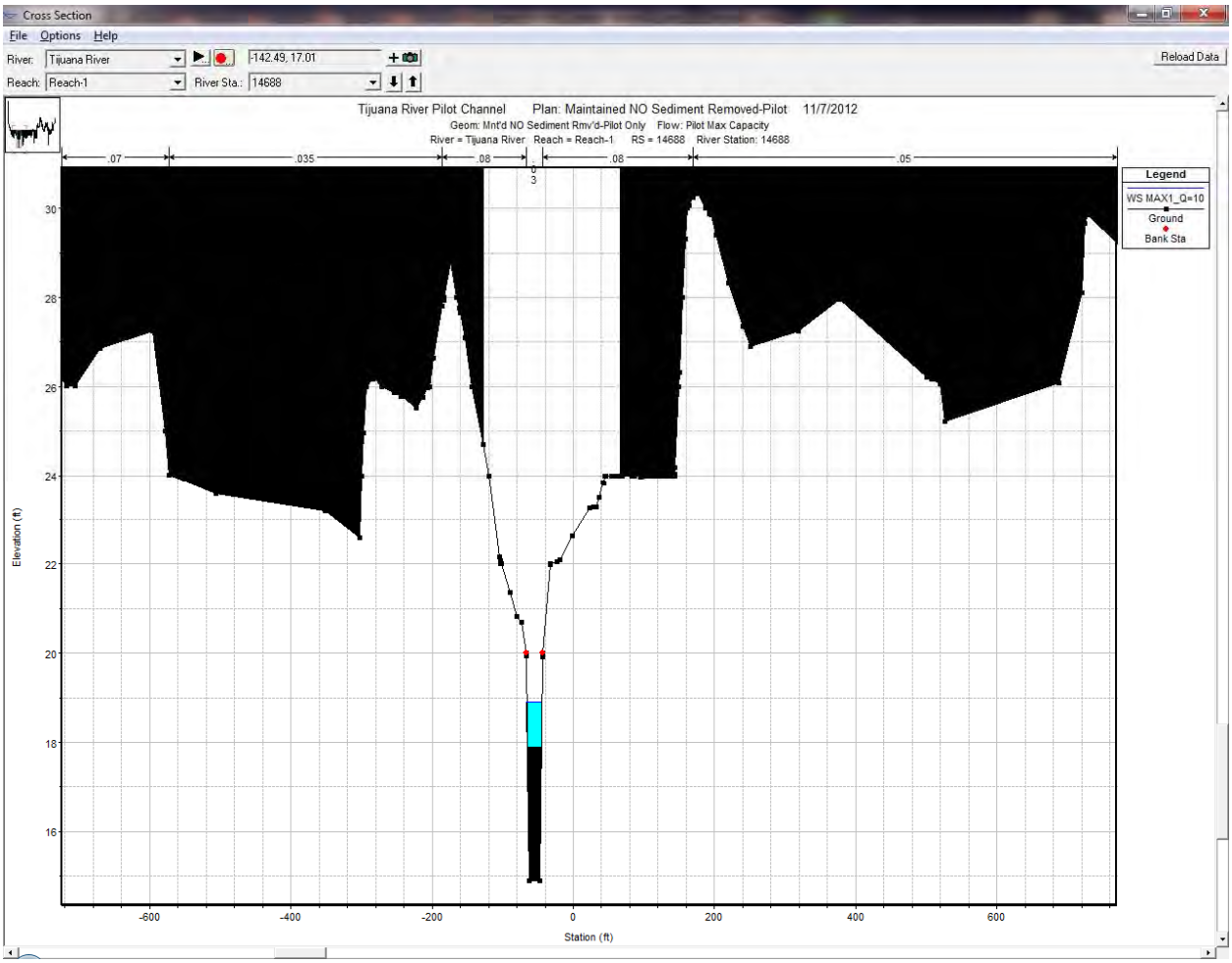

Cross Section
File Options Help
River: Tijuana River
1196.50, 19.47
Reach: Reach-1
River Sta.: 16235
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 16235 River Station: 16235
.035
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
30
28
26
24
22
20
18
16
14
500
1000
1500
2000
Station (ft)

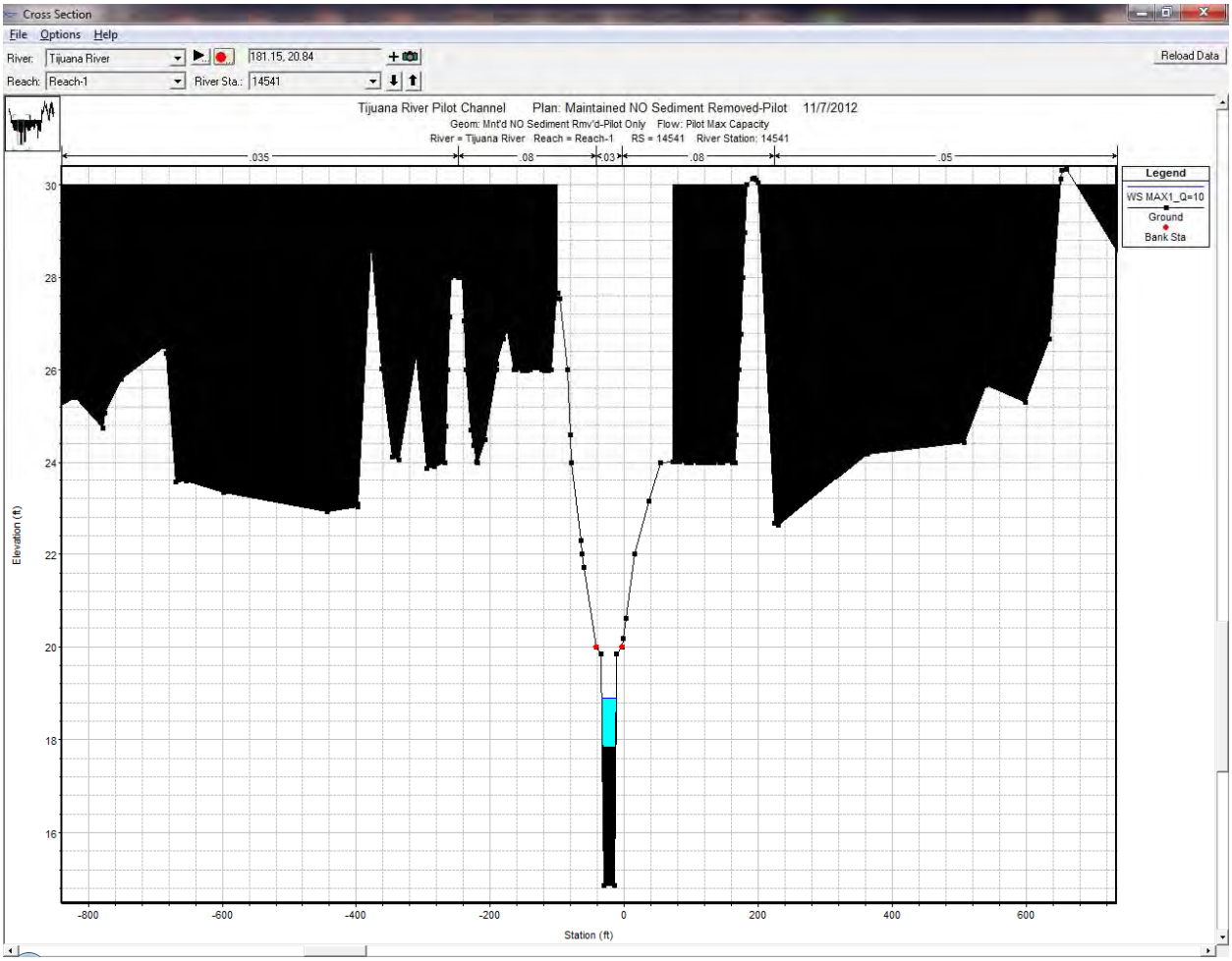

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
568.40, 20.79
River Sta.: 15501
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 15501 River Station: 15501
.035
.08
.03
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

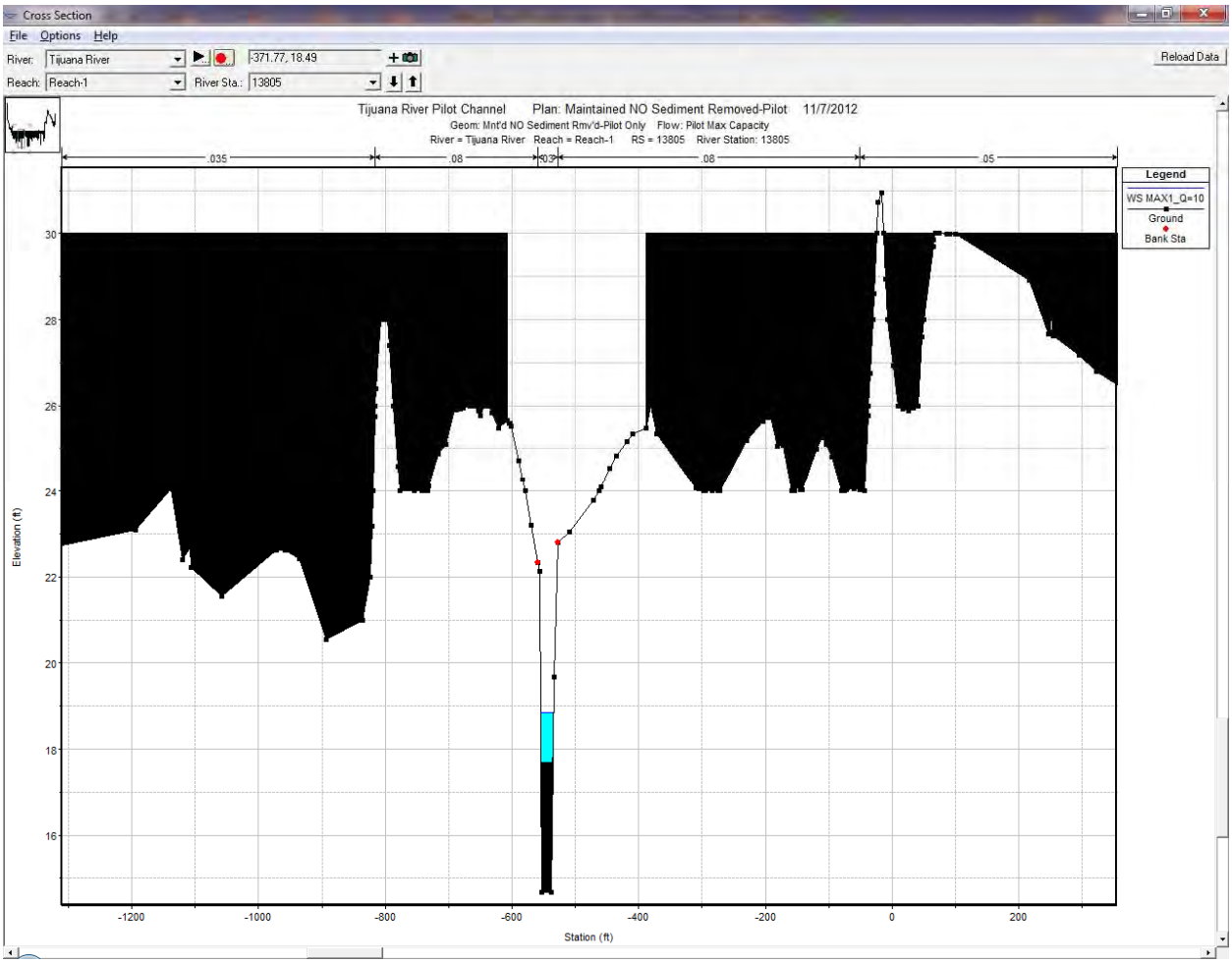

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
-68.76, 23.94
River Sta.: 14999
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14999 River Sta: 1499 - XSECTION AT U/S END OF PILOT CHANNEL
.07
.035
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

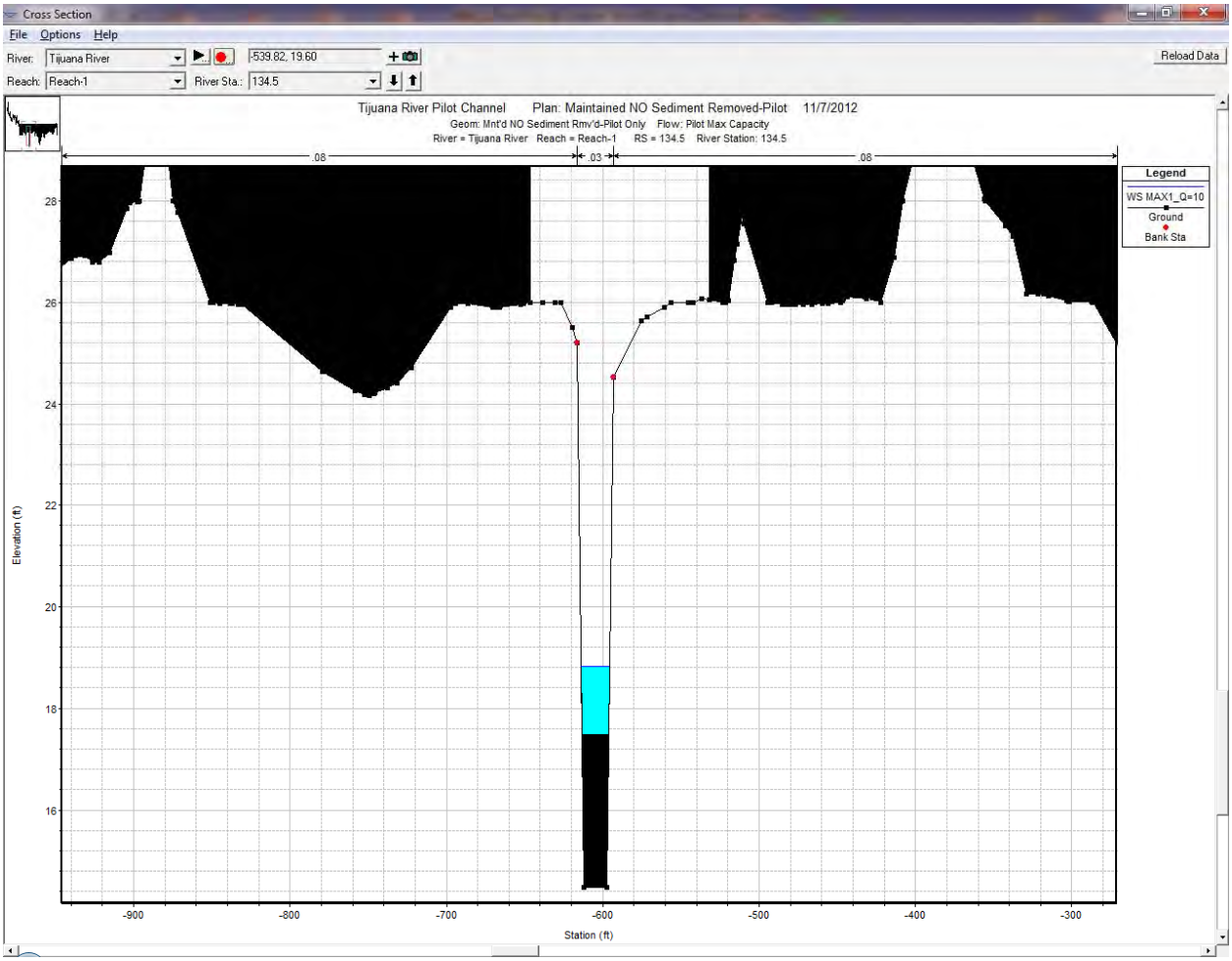

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14856 BR U
288.72, 25.00
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.08
.07
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

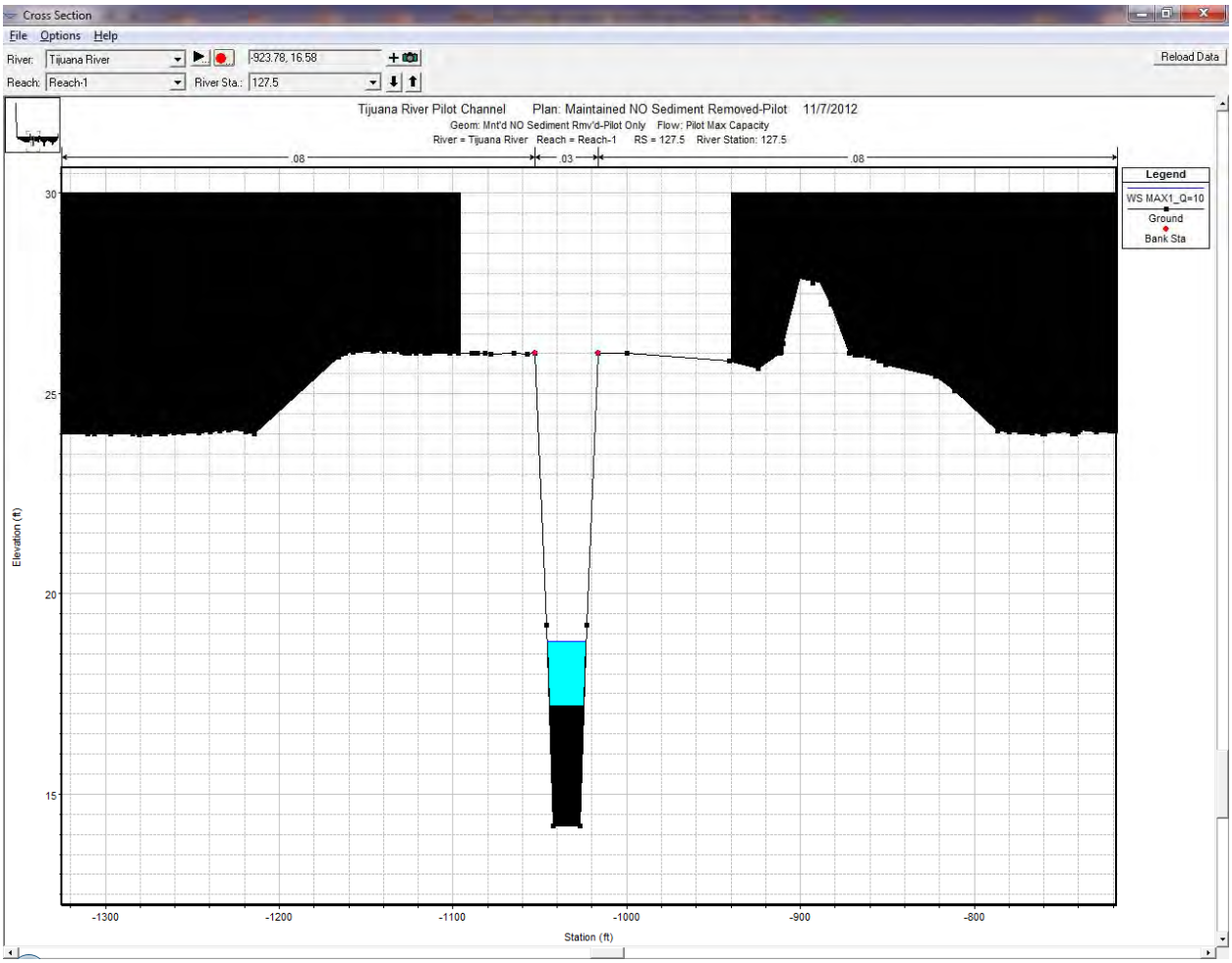

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14856 BR D
351.87, 22.56
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.08
.05
.05
.07
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

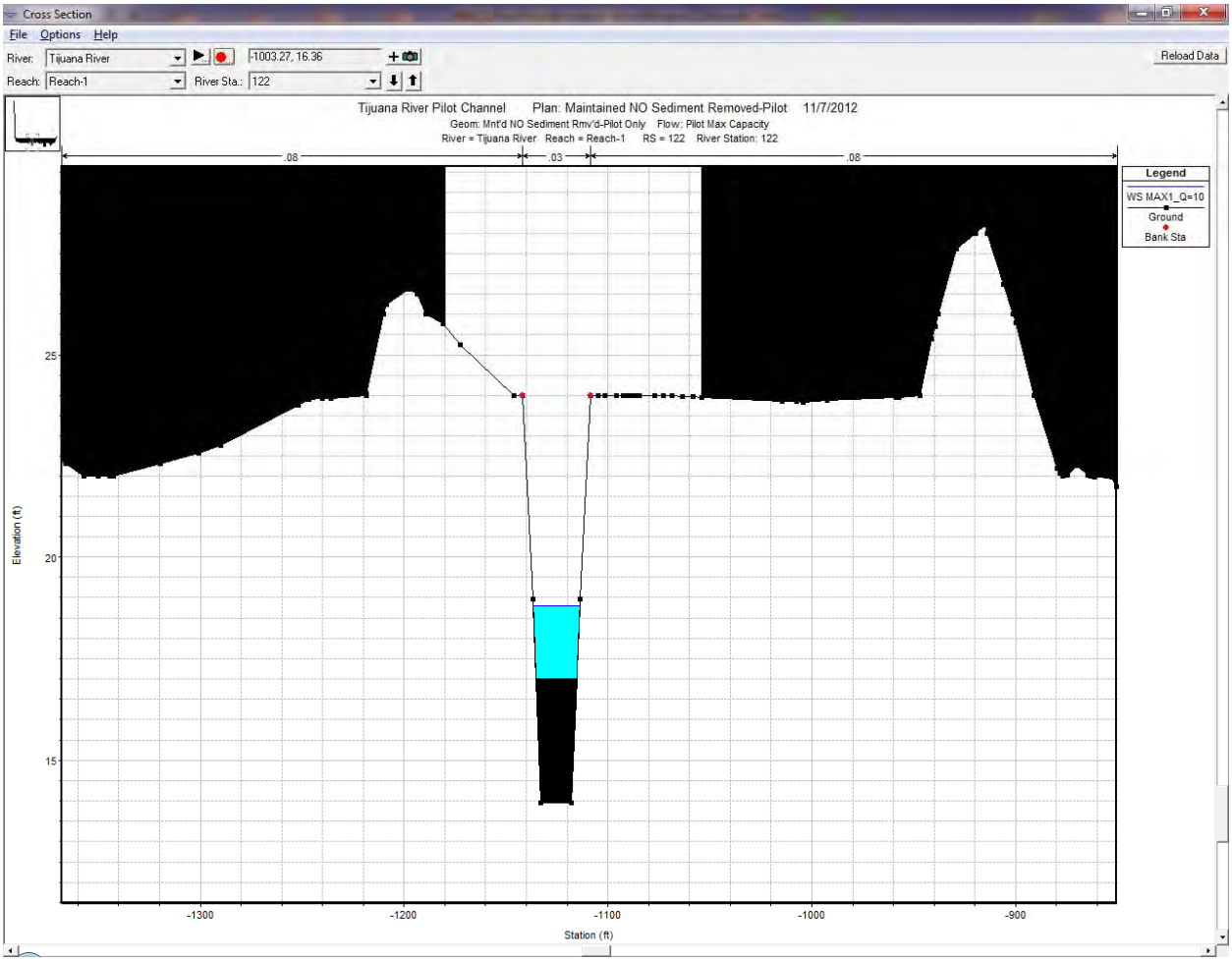

Cross Section
File Options Help
River: Tijuana River
-142.49, 17.01
Reach: Reach-1
River Sta.: 14688
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14688 River Station: 14688
.07
.035
.08
.03
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

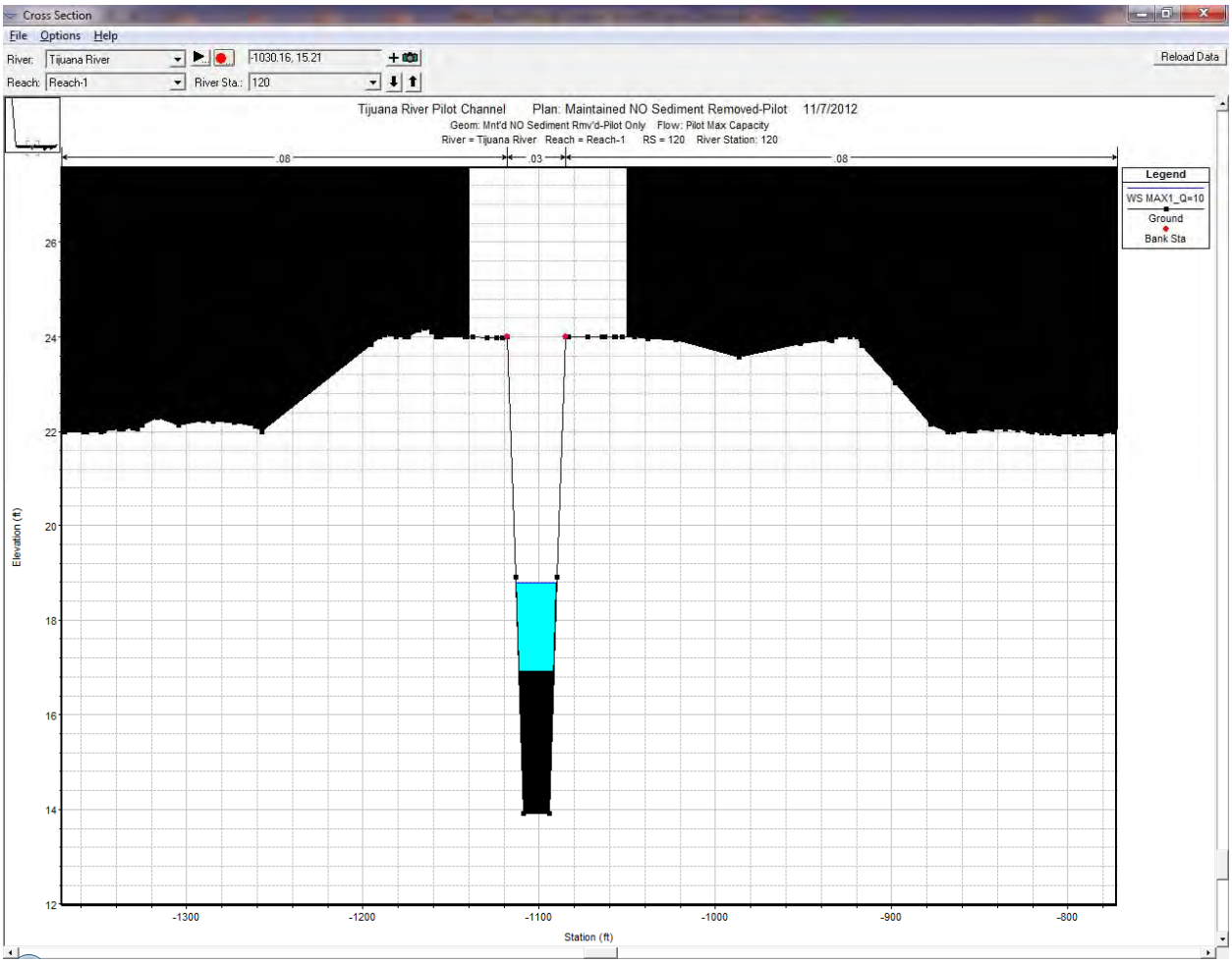

Cross Section
File Options Help
River: Tijuana River
181.15, 20.84
Reach: Reach-1
River Sta.: 14541
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 14541 River Station: 14541
.035
.08
.03
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

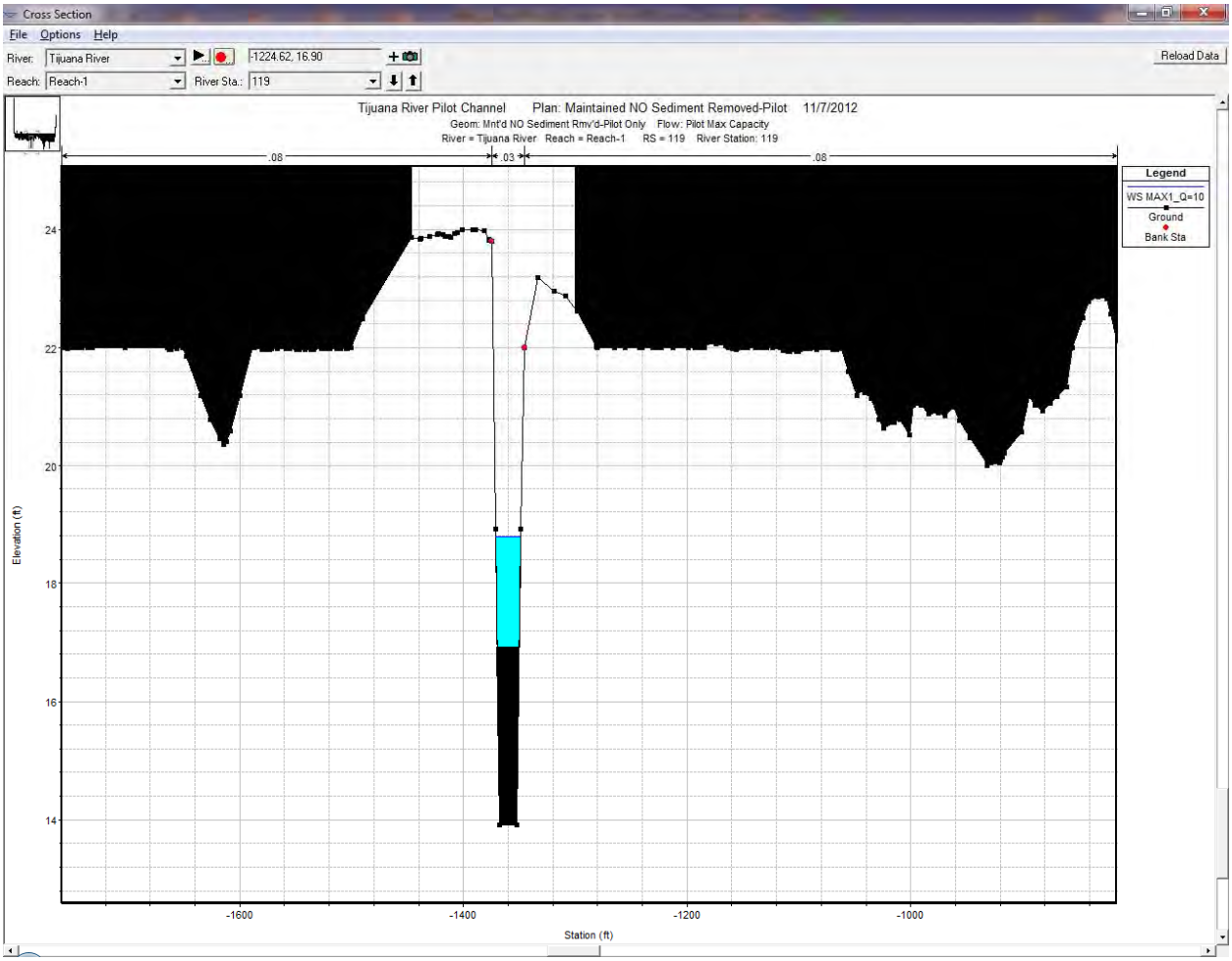

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 13805
-371.77, 18.49
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 13805 River Station: 13805
.035
.08
.03
.08
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

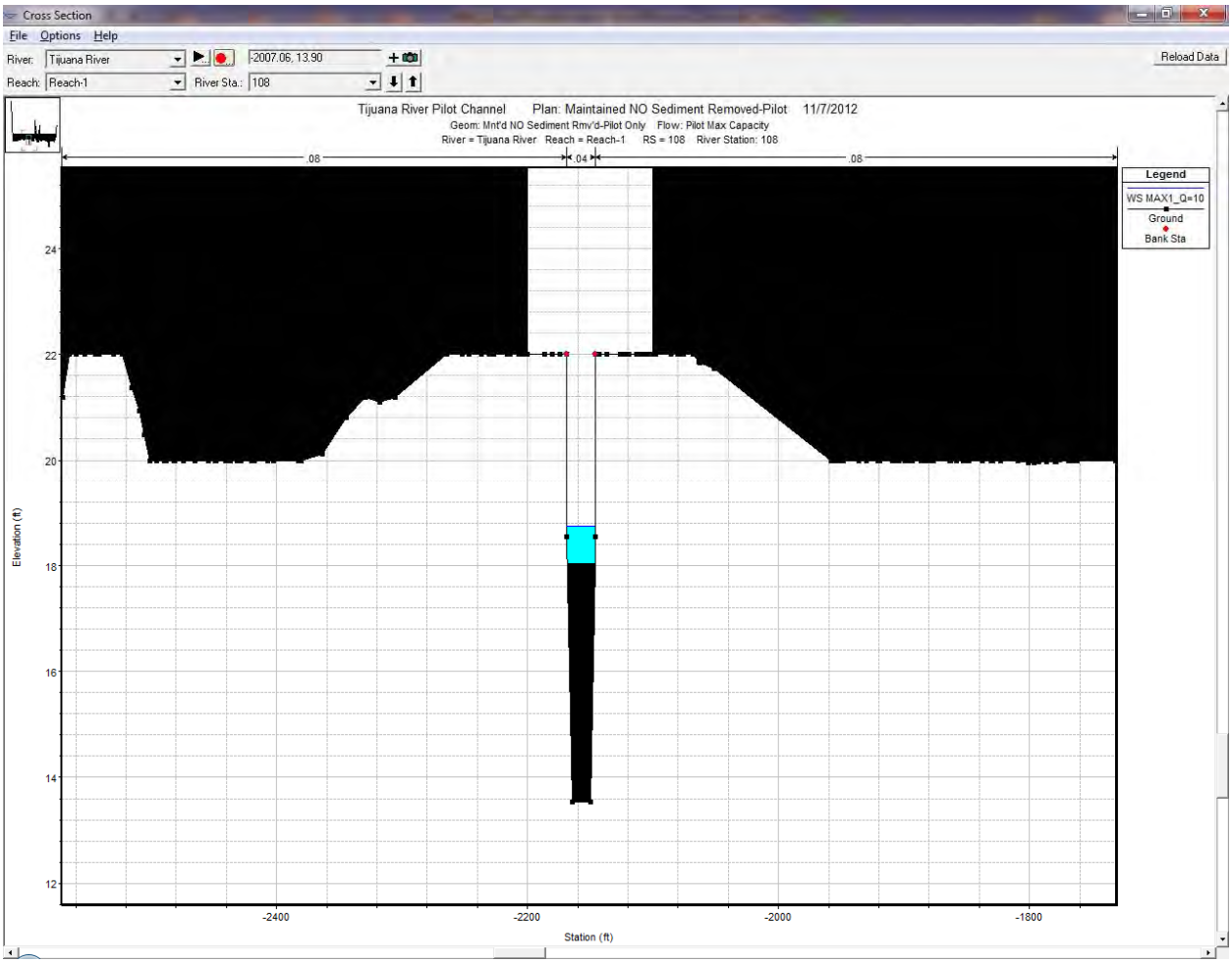

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 134.5
-539.82, 19.60
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 134.5 River Station: 134.5
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

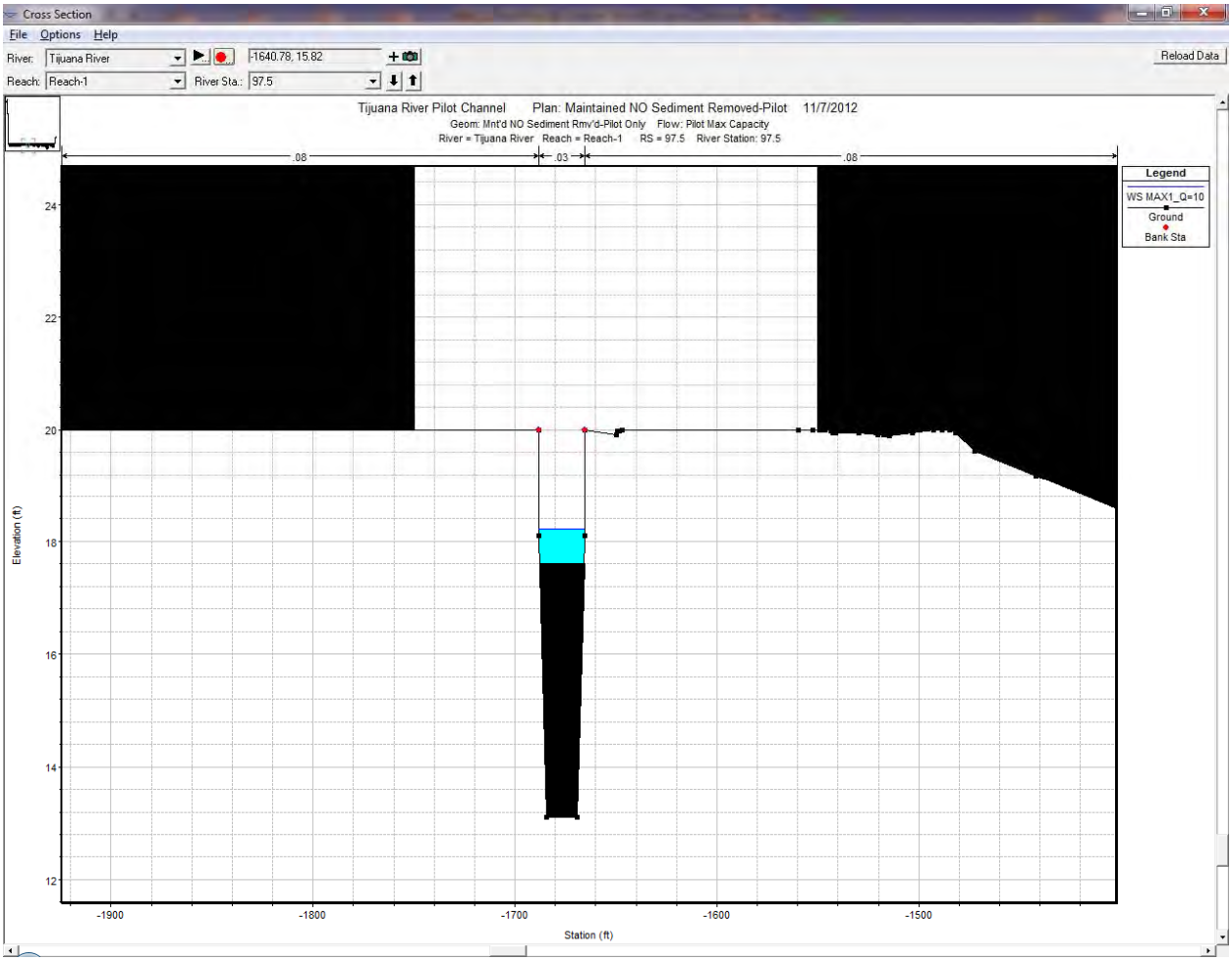

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 127.5
-923.78, 16.58
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 127.5 River Station: 127.5
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
30
25
20
15
Elevation (ft)
-1300
-1200
-1100
-1000
-900
-800
Station (ft)

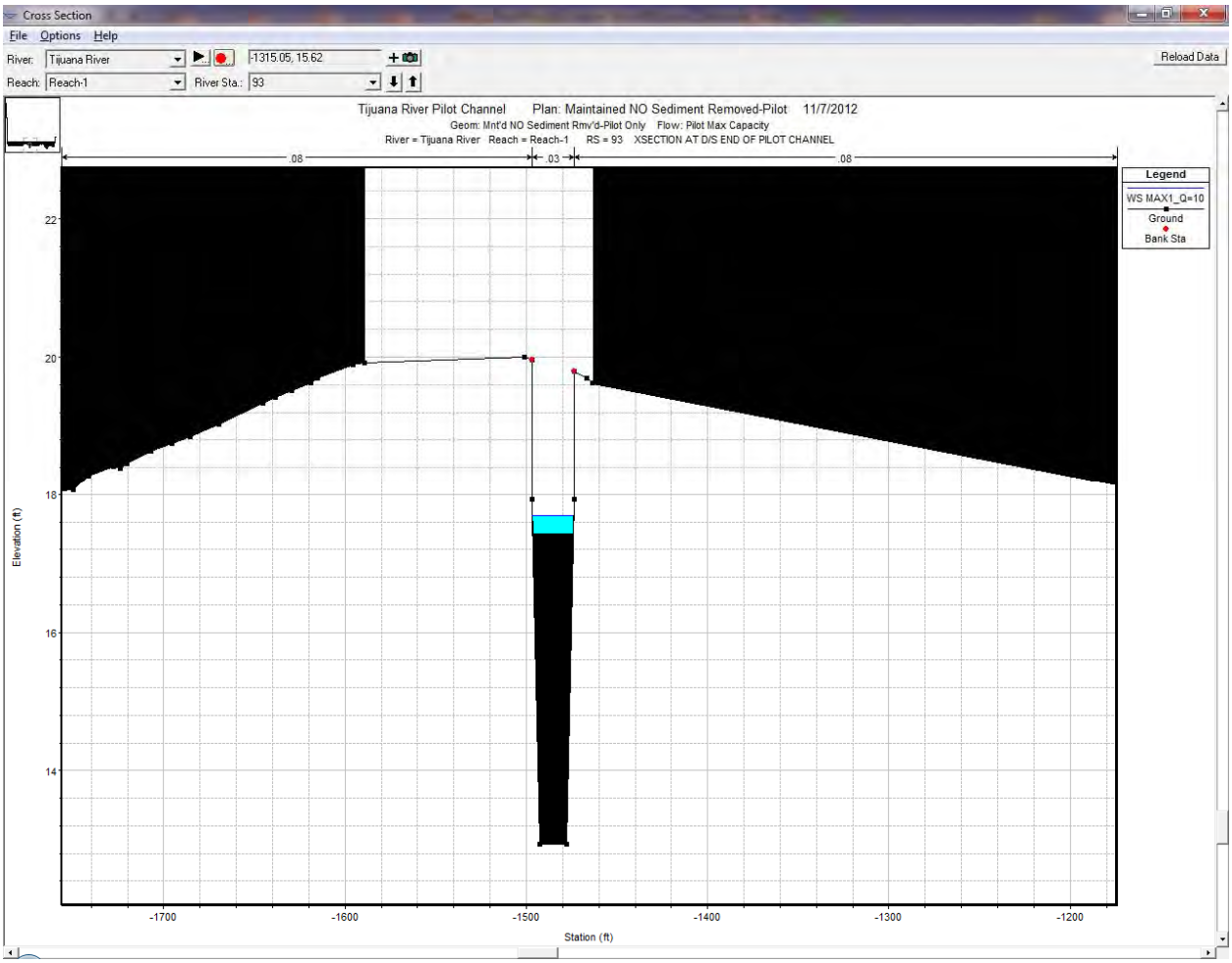

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 122
-1003.27, 16.36
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 122 River Station: 122
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
25
20
15
Elevation (ft)
-1300
-1200
-1100
-1000
-900
Station (ft)

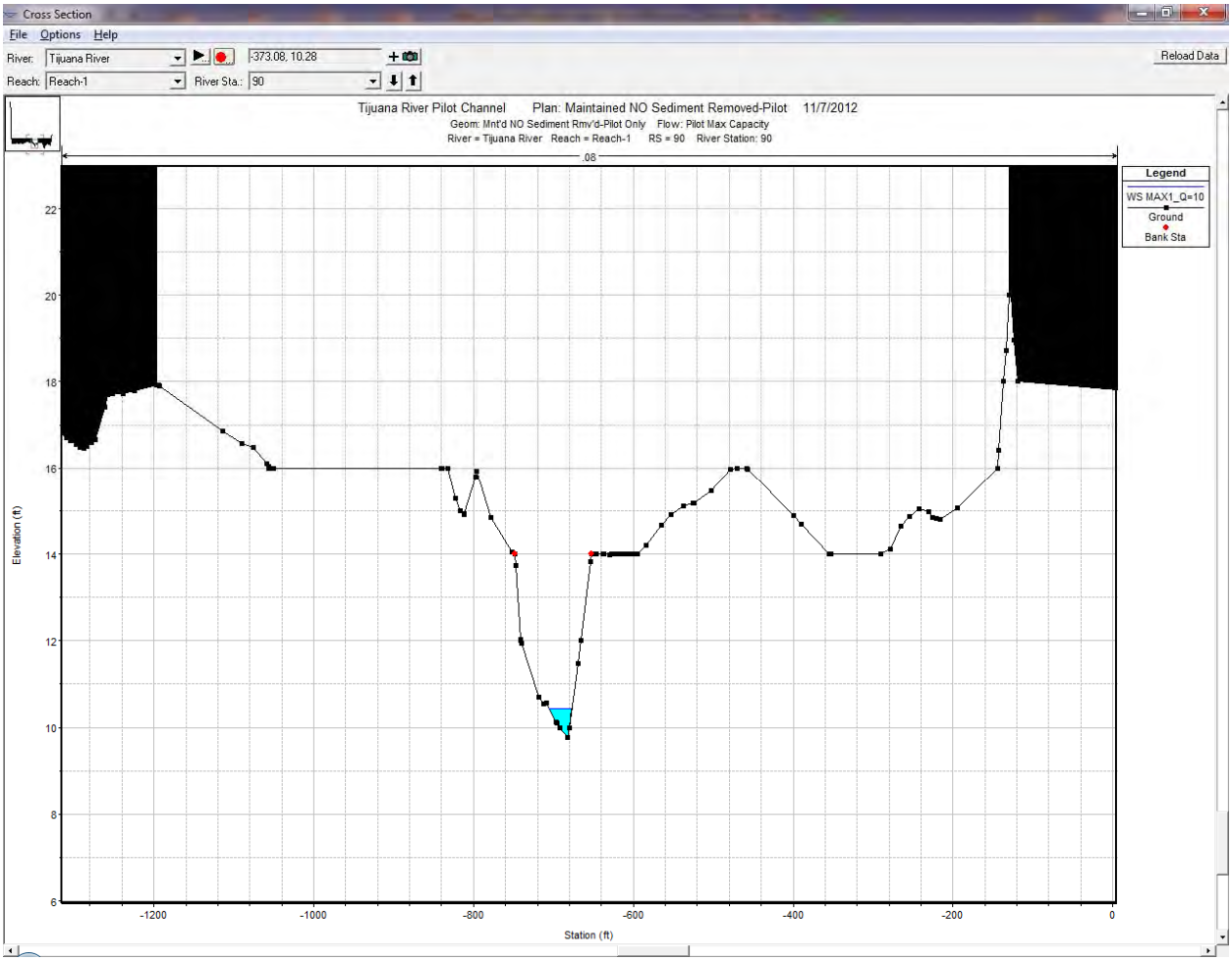

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 120
-1030.16, 15.21
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 120 River Station: 120
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

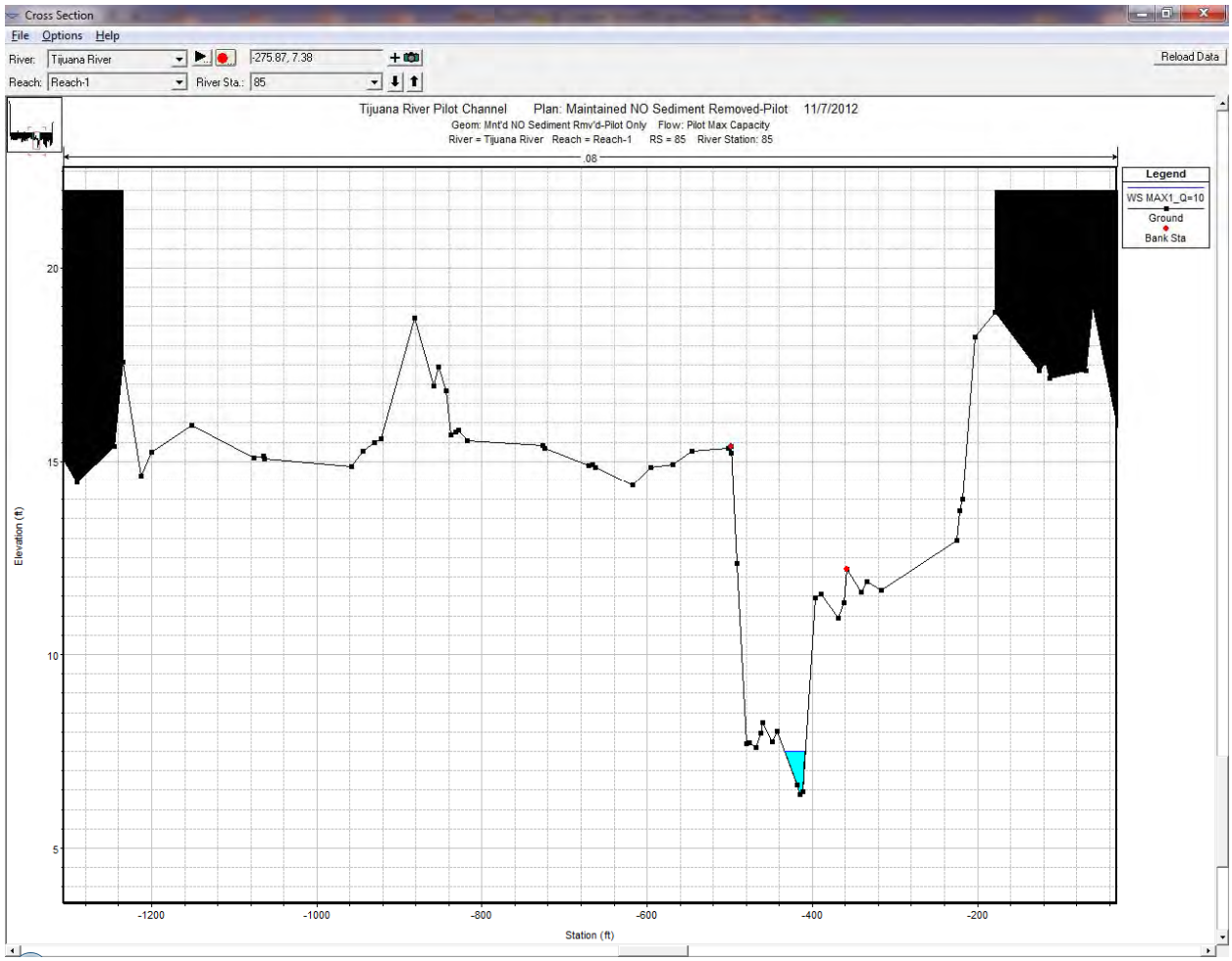

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 119
-1224.62, 16.90
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 119 River Station: 119
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)

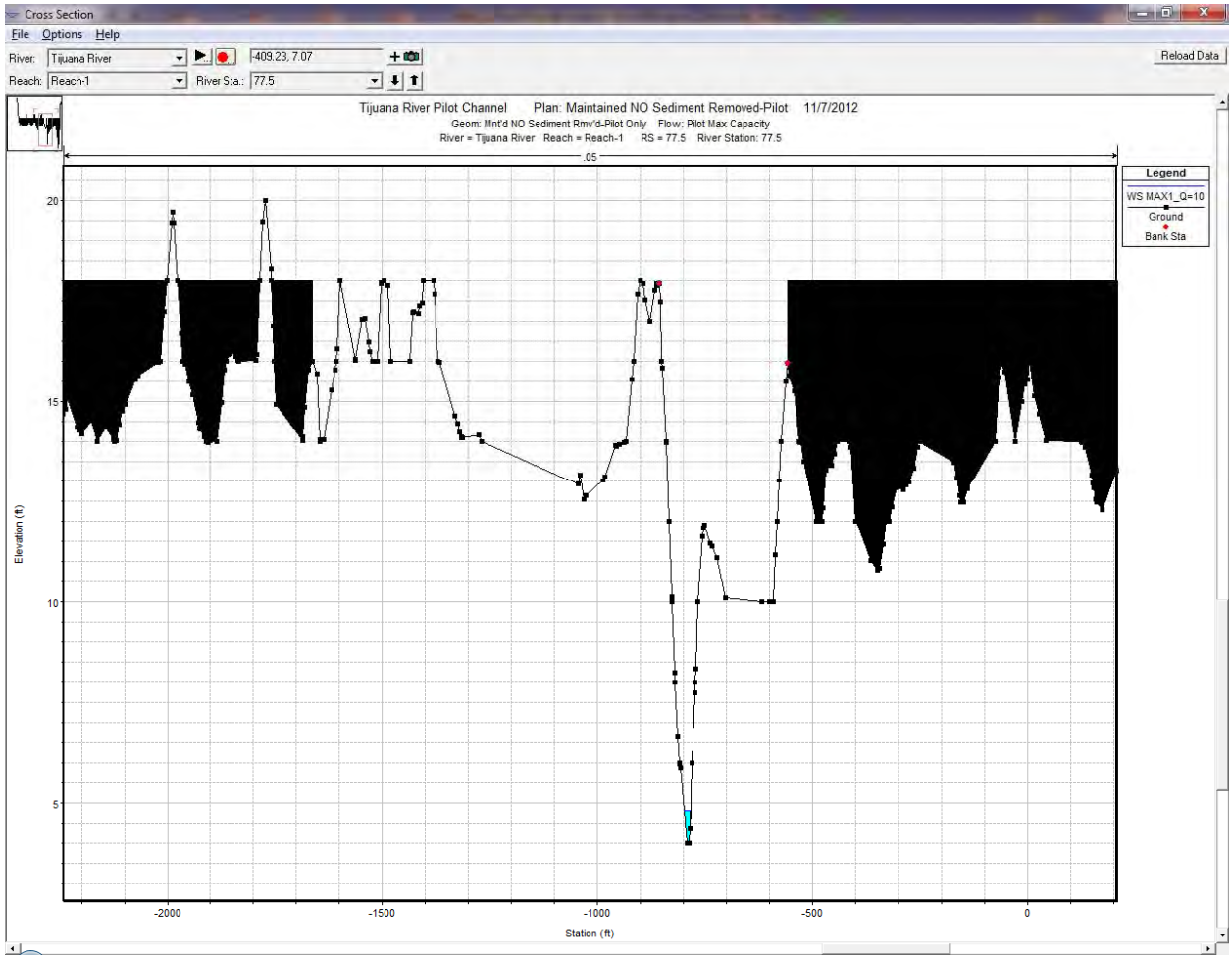

Cross Section
File Options Help
River: Tijuana River
-2007.06, 13.90
Reach: Reach-1
River Sta.: 108
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 108 River Station: 108
.08
.04
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
24
22
20
18
16
14
12
-2400
-2200
-2000
-1800
Station (ft)


Cross Section
File Options Help
River: Tijuana River
-1640.78, 15.82
Reach: Reach-1
River Sta.: 97.5
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 97.5 River Station: 97.5
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
24
22
20
18
16
14
12
-1900
-1800
-1700
-1600
-1500
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 93
-1315.05, 15.62
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 93 XSECTION AT D/S END OF PILOT CHANNEL
.08
.03
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 90
-373.08, 10.28
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 90 River Station: 90
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 85
-275.87, 7.38
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 85 River Station: 85
.08
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)
20
15
10
5
-1200
-1000
-800
-600
-400
-200

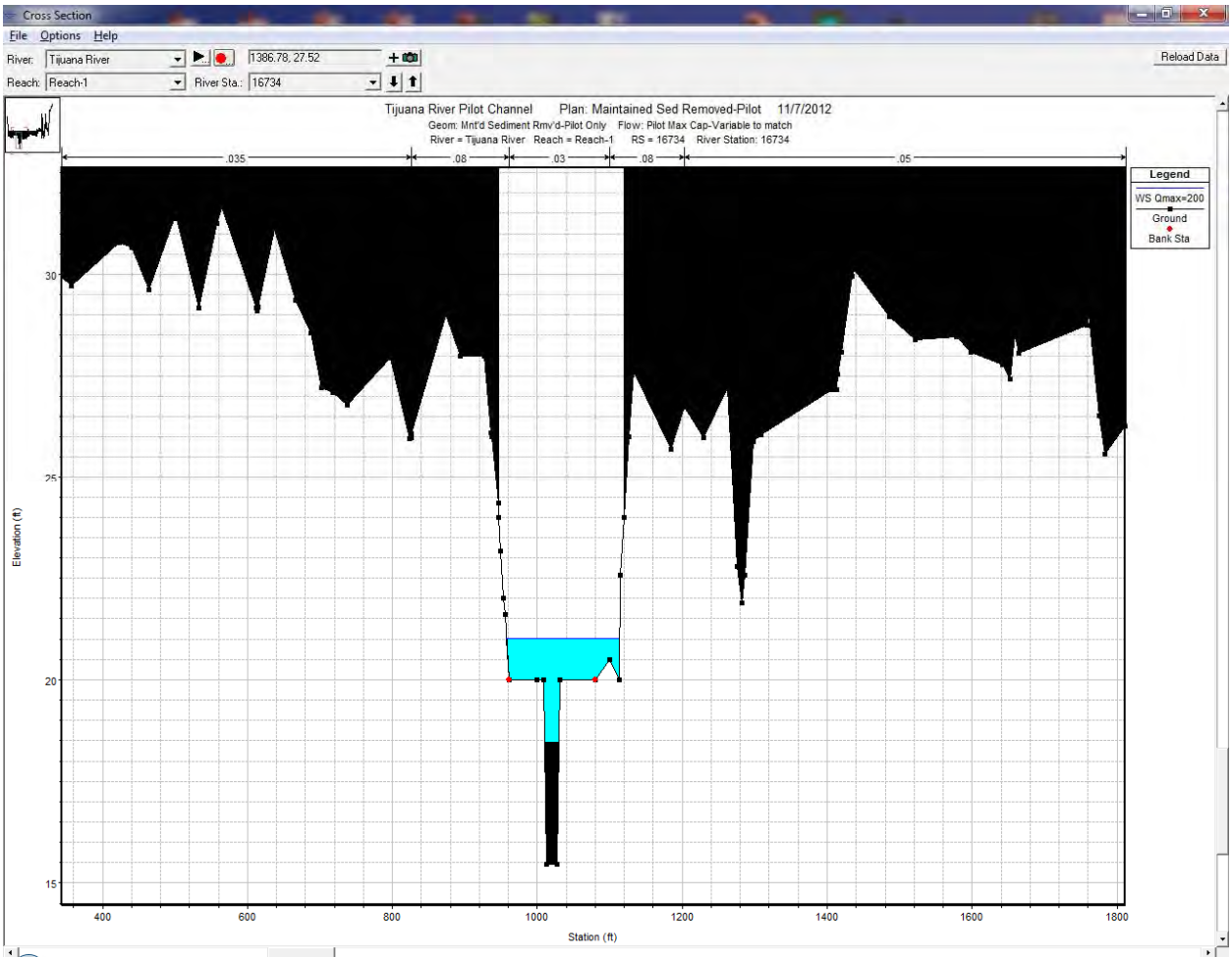

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 77.5
-409.23, 7.07
Reload Data
Tijuana River Pilot Channel Plan: Maintained NO Sediment Removed-Pilot 11/7/2012
Geom: Mnt'd NO Sediment Rmv'd-Pilot Only Flow: Pilot Max Capacity
River = Tijuana River Reach = Reach-1 RS = 77.5 River Station: 77.5
.05
Legend
WS MAX1_Q=10
Ground
Bank Sta
Elevation (ft)
Station (ft)
20
15
10
5
-2000
-1500
-1000
-500
0

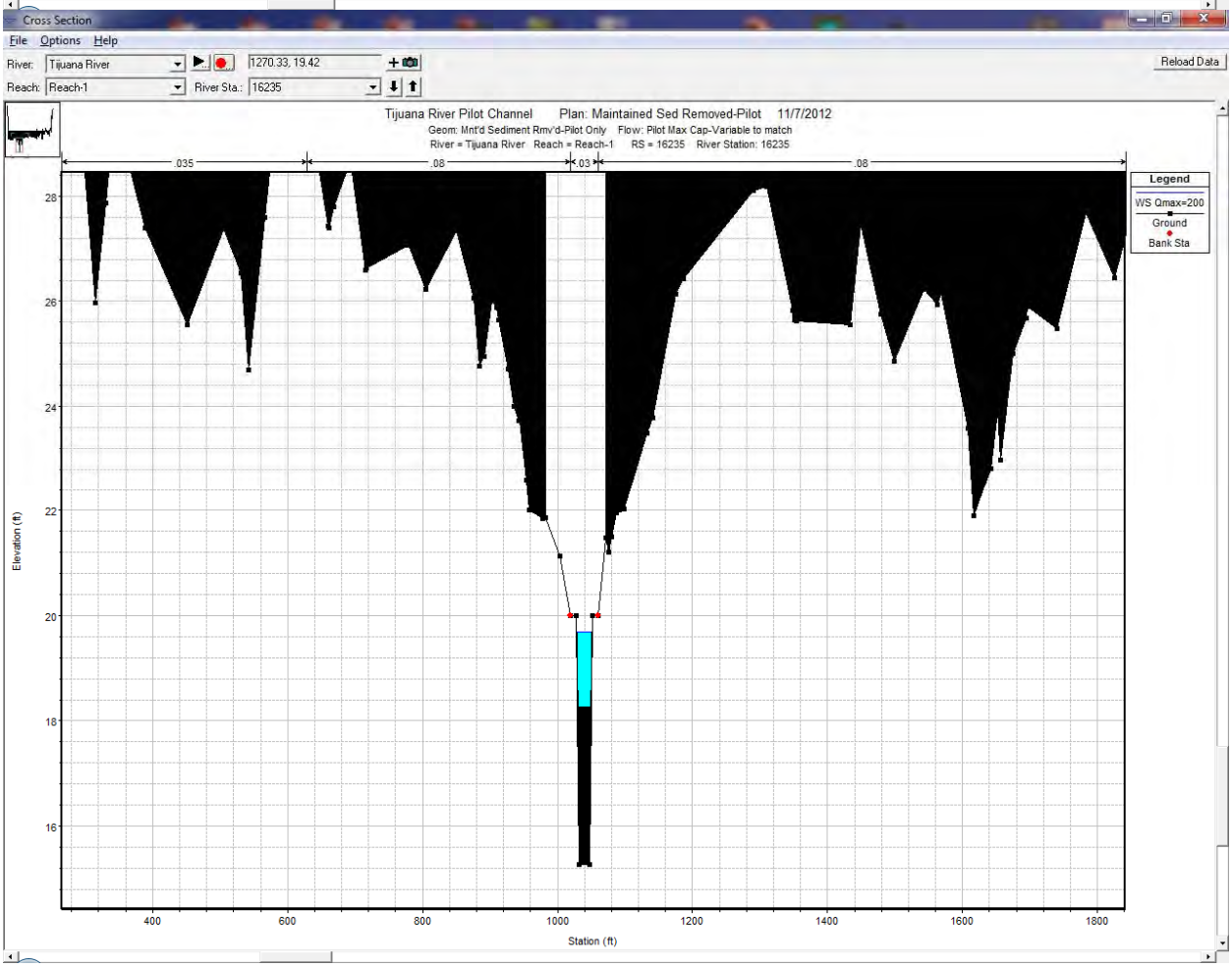
For Smuggler's Gulch Channel "Maintained Condition – No Sediment Removed" Detailed Hydraulic Results, see the "Current Vegetated Condition" Hydraulic Results.

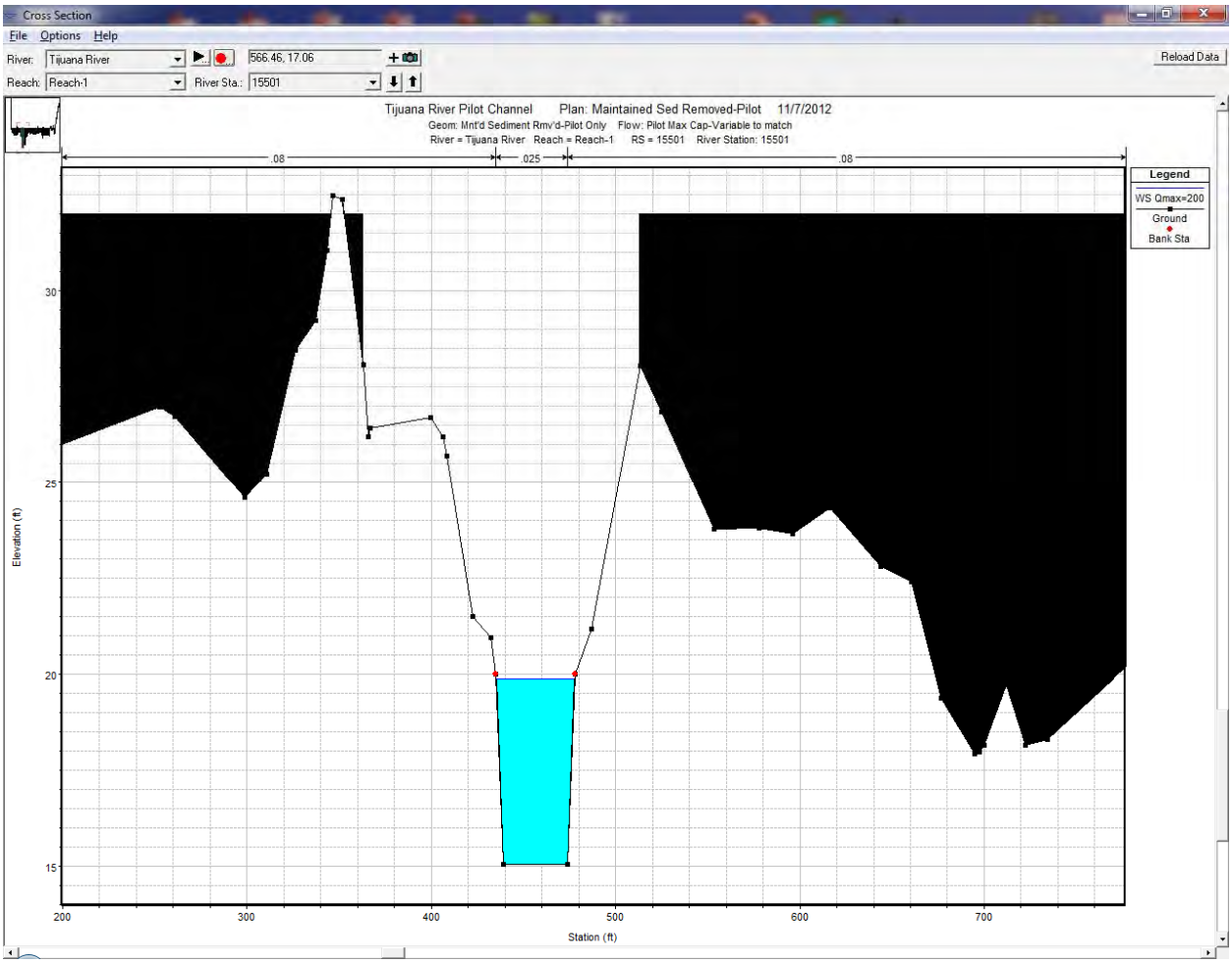
DETAILED HYDRAULIC RESULTS FOR MAINTAINED CONDITION MODEL (SEDIMENT REMOVED)

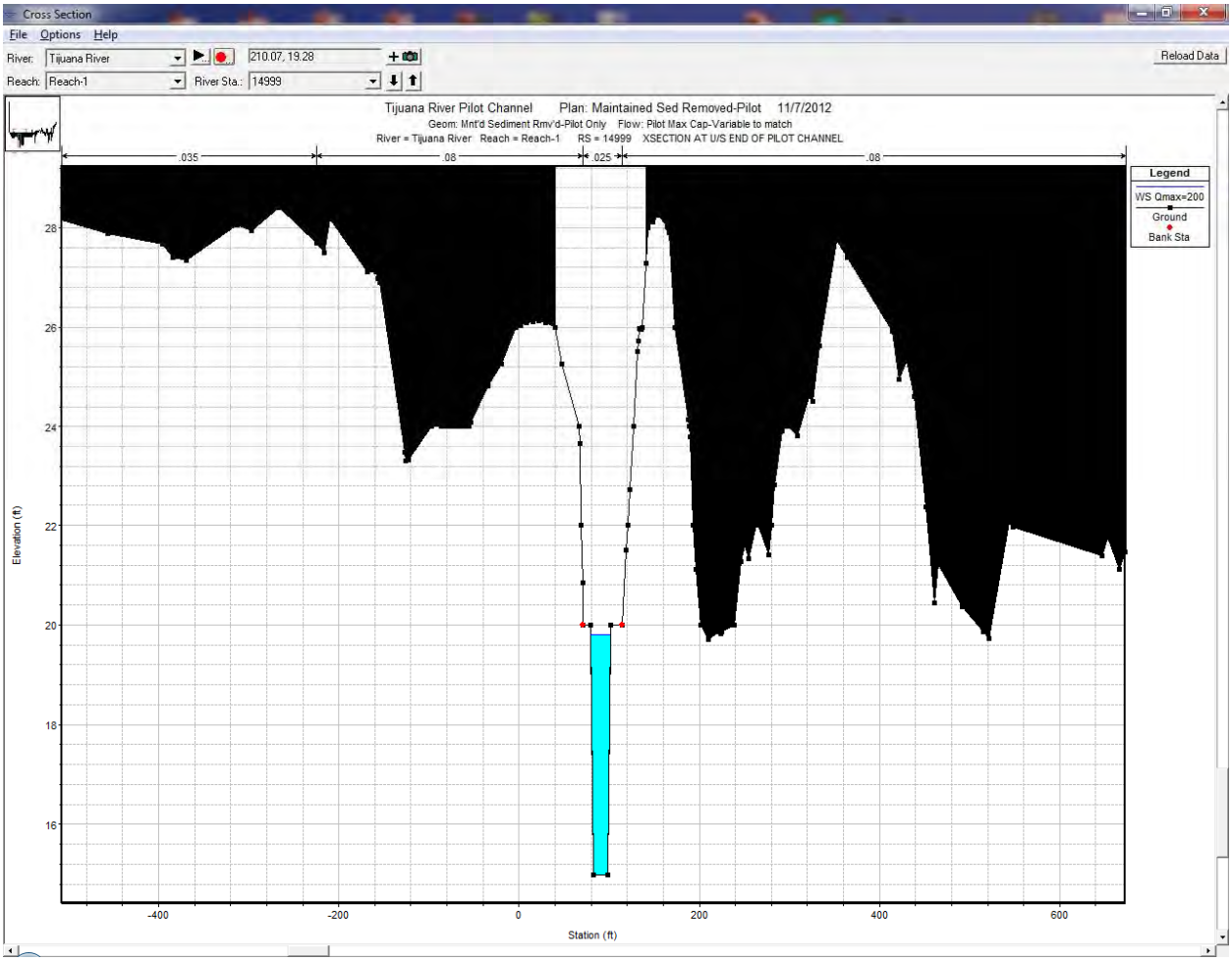
HEC-RAS Plan: MntdSedRemPilot River: Tijuana River Reach: Reach-1 Profile: Qmax=200

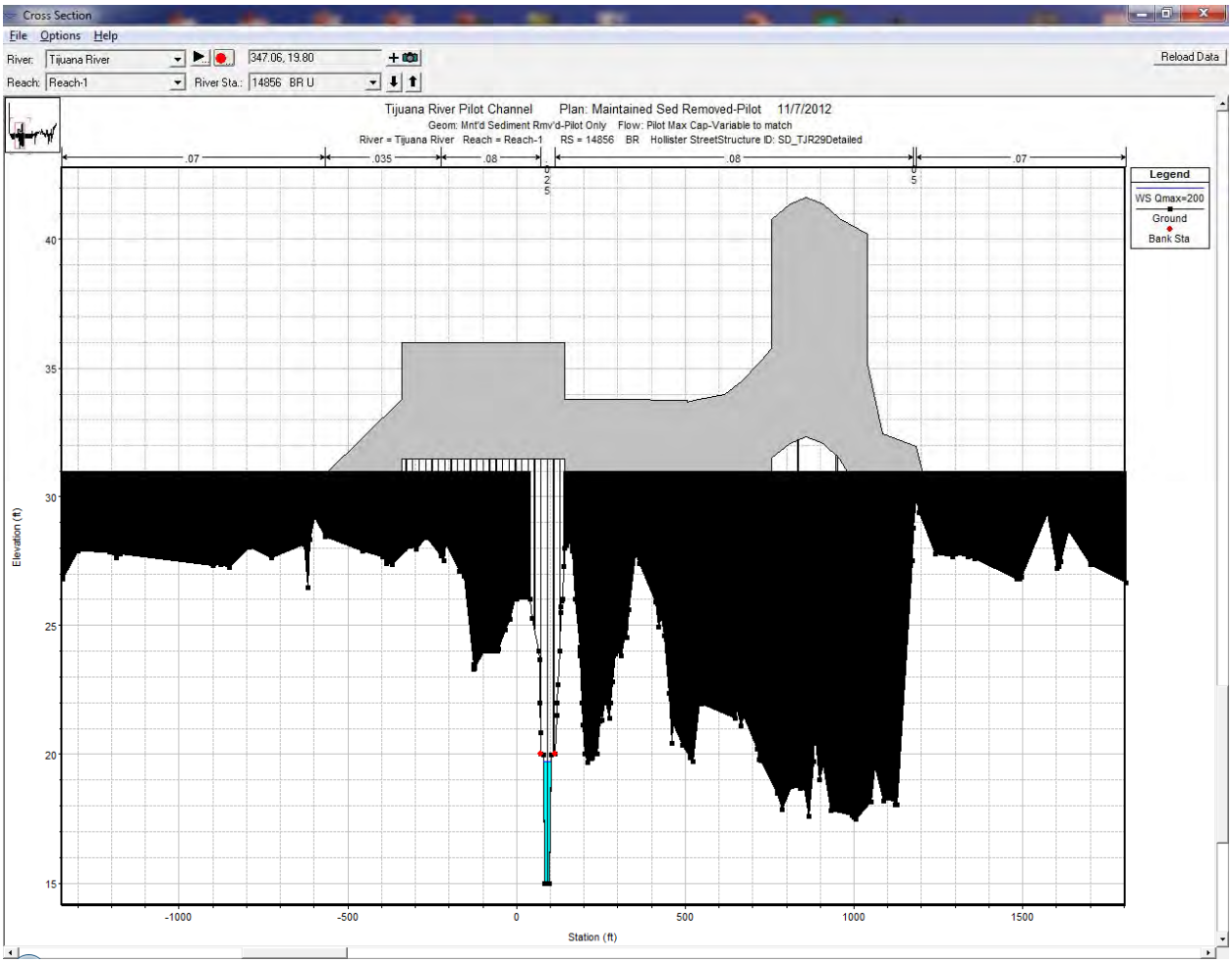
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	16734	Qmax=200	200.00	18.46	21.01	19.87	21.03	0.000423	1.20	180.70	156.31	0.19
Reach-1	16235	Qmax=200	200.00	18.27	19.69	19.69	20.37	0.012904	6.60	30.30	22.53	1.00
Reach-1	15501	Qmax=200	200.00	15.05	19.89	16.05	19.90	0.000099	1.07	186.57	42.49	0.09
Reach-1	14999	Qmax=200	200.00	14.99	19.80	16.70	19.87	0.000279	2.21	90.61	22.69	0.19
Reach-1	14856		Bridge									
Reach-1	14688	Qmax=200	200.00	14.90	19.68	16.61	19.76	0.000746	2.22	89.96	22.61	0.20
Reach-1	14541	Qmax=200	200.00	14.85	19.63	16.56	19.71	0.000285	2.22	89.90	22.64	0.20
Reach-1	13805	Qmax=200	200.00	14.68	19.49	16.40	19.57	0.000300	2.28	87.70	21.44	0.20
Reach-1	134.5	Qmax=200	200.00	14.48	19.23	16.22	19.32	0.000933	2.50	79.88	18.66	0.21
Reach-1	127.5	Qmax=200	200.00	14.20	18.89	15.91	18.97	0.000304	2.28	87.88	22.50	0.20
Reach-1	122	Qmax=200	200.00	13.96	18.70	15.67	18.78	0.000292	2.24	89.11	22.59	0.20
Reach-1	120	Qmax=200	200.00	13.91	18.67	15.62	18.74	0.000289	2.24	89.42	22.61	0.20
Reach-1	119	Qmax=200	200.00	13.92	18.64	15.63	18.72	0.000298	2.26	88.55	22.55	0.20
Reach-1	108	Qmax=200	200.00	13.54	18.18	15.25	18.27	0.000814	2.30	86.92	22.43	0.21
Reach-1	97.5	Qmax=200	200.00	13.10	16.94	14.81	17.07	0.001437	2.88	69.47	21.15	0.28
Reach-1	93	Qmax=200	200.00	12.93	15.98	14.64	16.20	0.002840	3.75	53.28	19.89	0.40
Reach-1	90	Qmax=200	200.00	9.77	11.99	11.13	12.05	0.009180	2.10	95.35	74.31	0.33
Reach-1	85	Qmax=200	200.00	6.39	9.56	8.11	9.59	0.002046	1.28	155.80	81.54	0.16
Reach-1	77.5	Qmax=200	200.00	4.00	7.12	5.94	7.24	0.003701	2.71	73.93	39.71	0.35

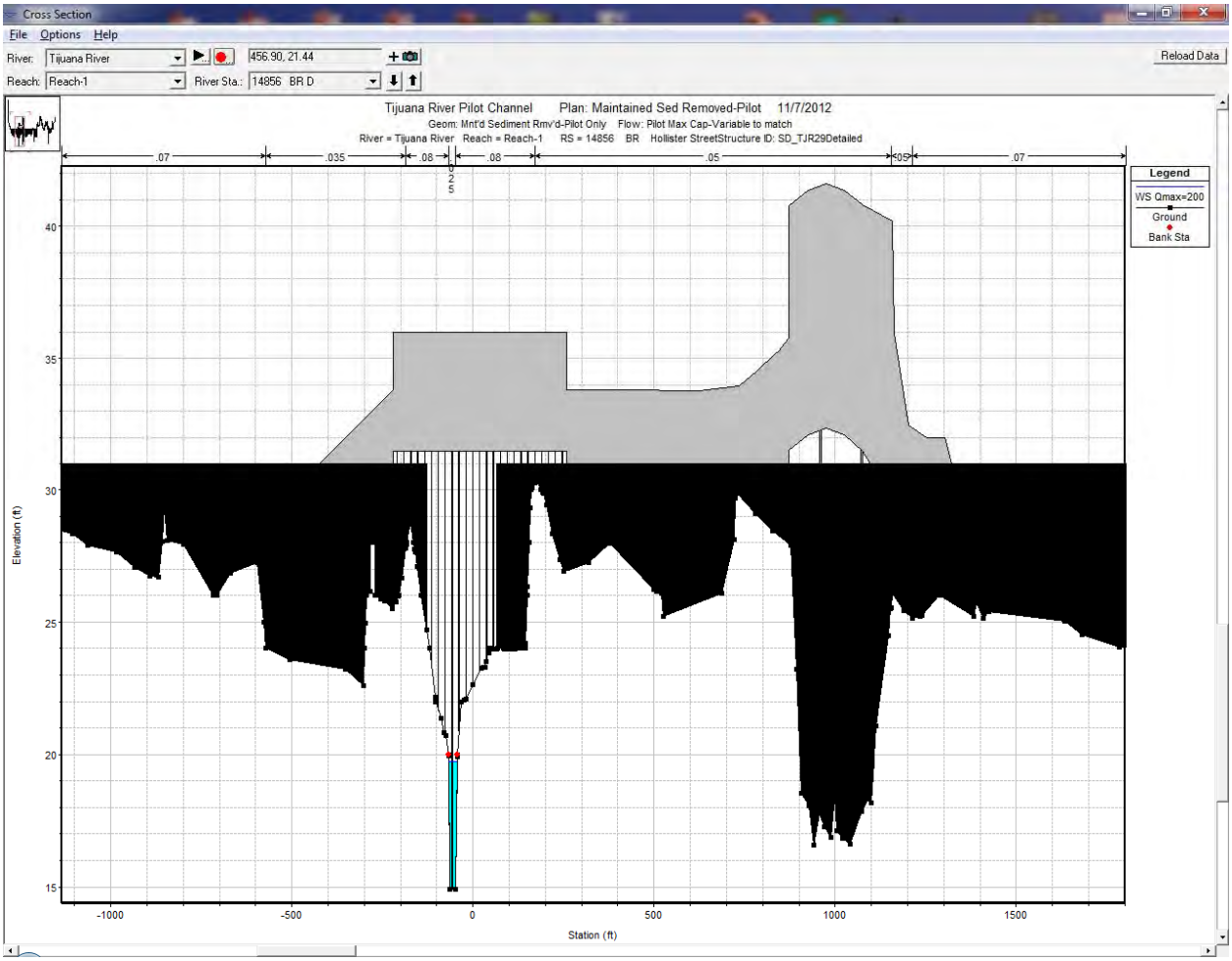

Cross Section
File Options Help
River: Tijuana River
1386.78, 27.52
Reach: Reach-1
River Sta.: 16734
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 16734 River Station: 16734
.035
.08
.03
.08
.05
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

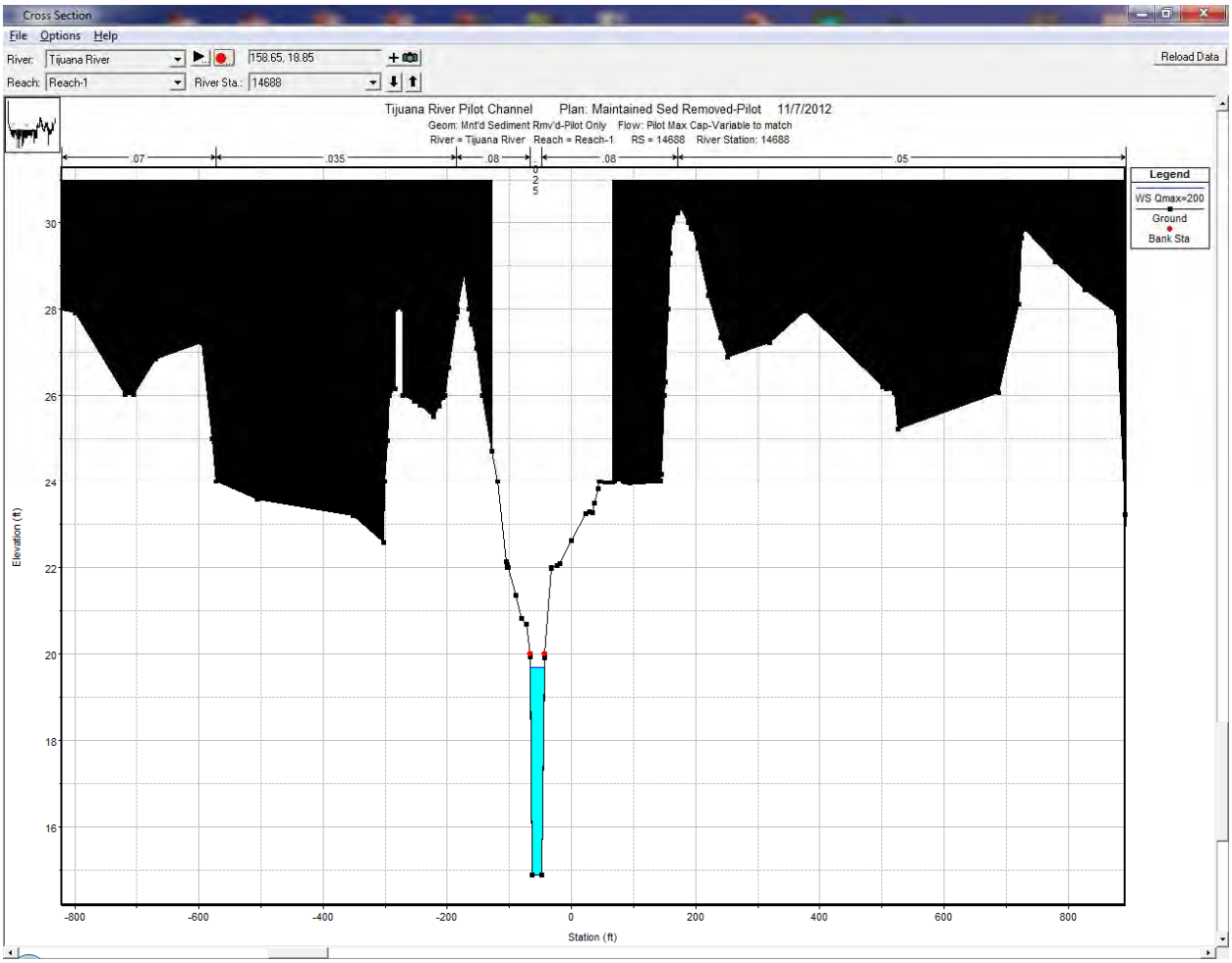

Cross Section
File Options Help
River: Tijuana River
1270.33, 19.42
Reach: Reach-1
River Sta.: 16235
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 16235 River Station: 16235
.035
.08
.03
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

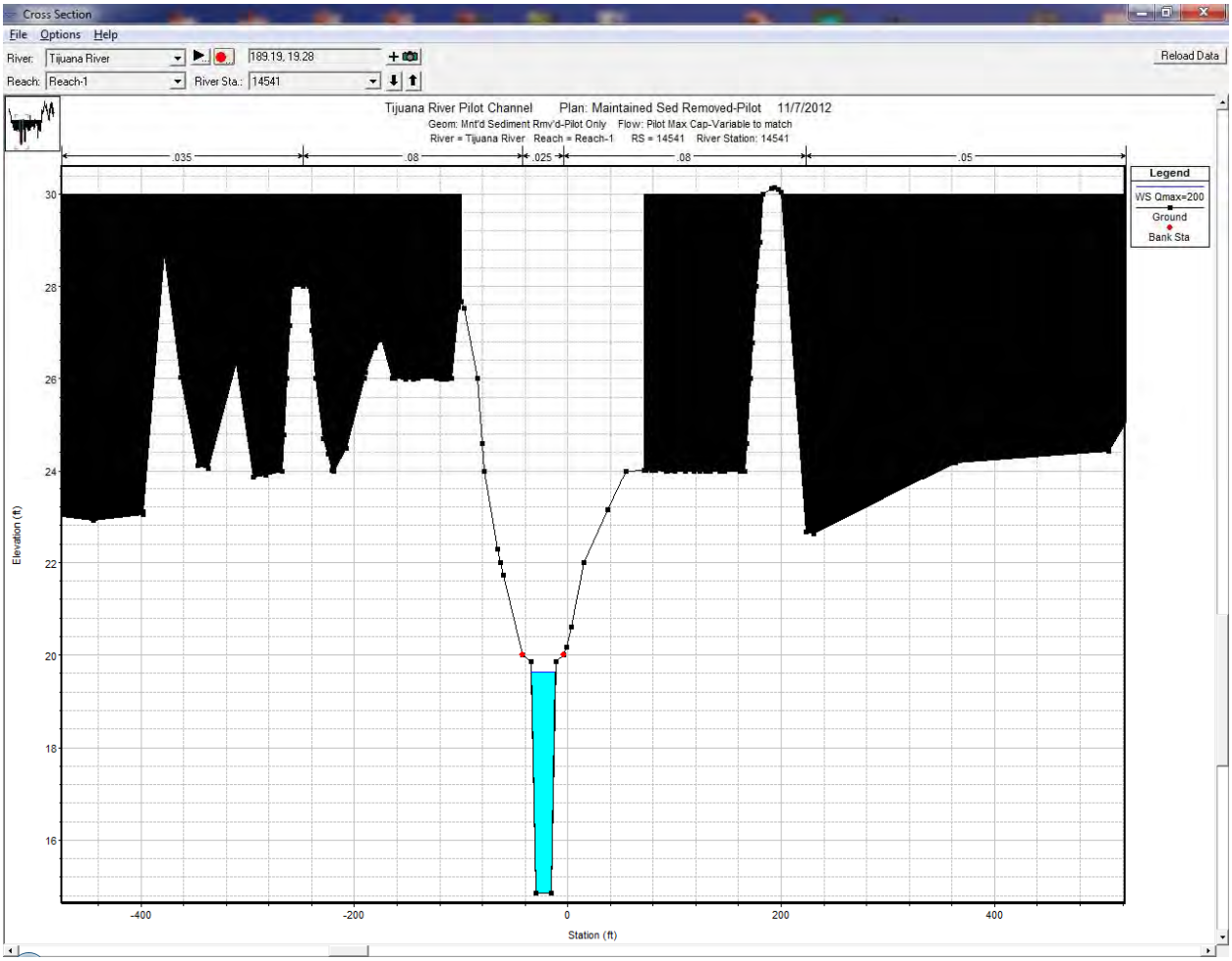

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 15501
566.46, 17.06
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 15501 River Station: 15501
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)
30
25
20
15
200
300
400
500
600
700

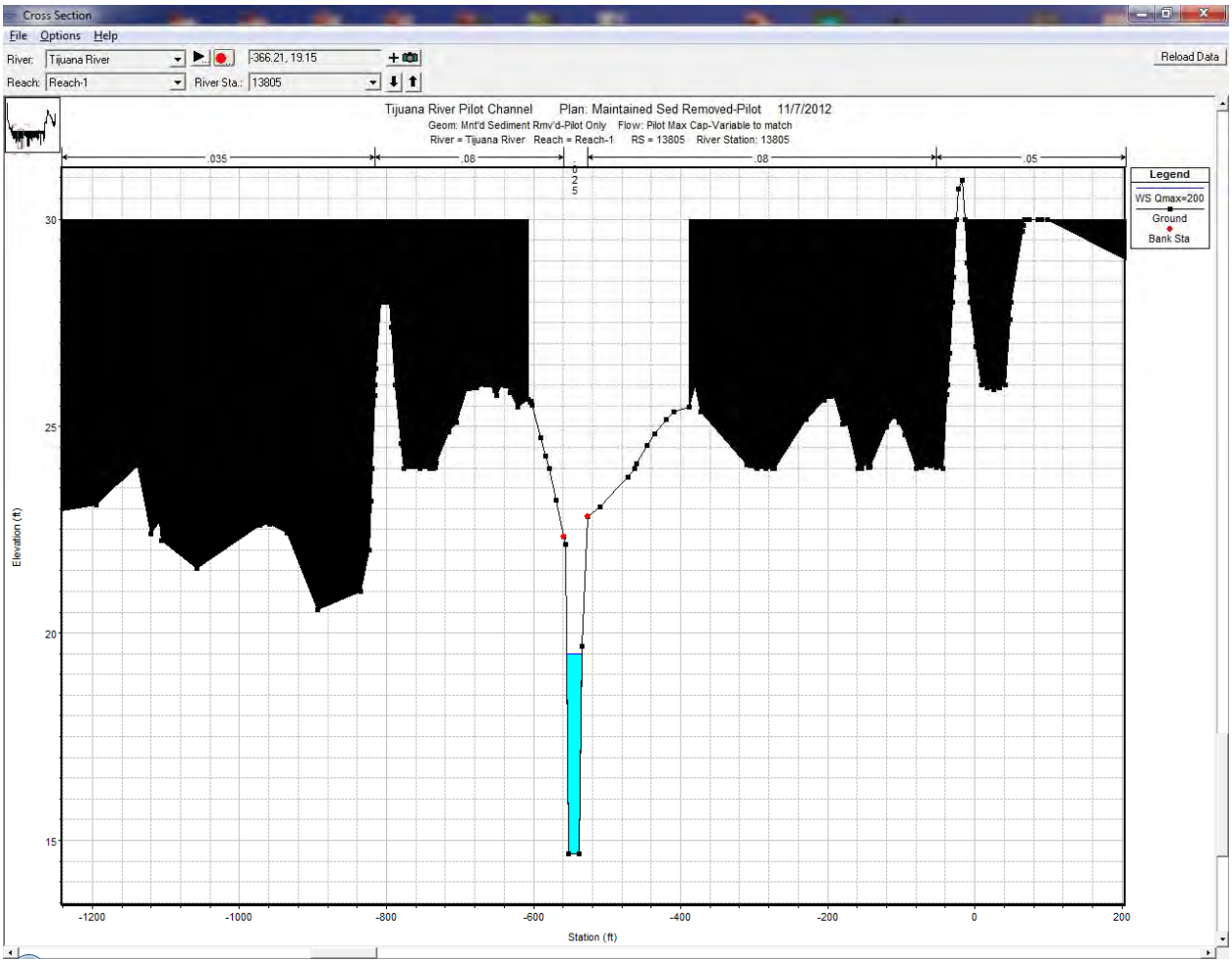

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14999
210.07, 19.28
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 14999 XSECTION AT U/S END OF PILOT CHANNEL
.035
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)
28
26
24
22
20
18
16
-400
-200
0
200
400
600

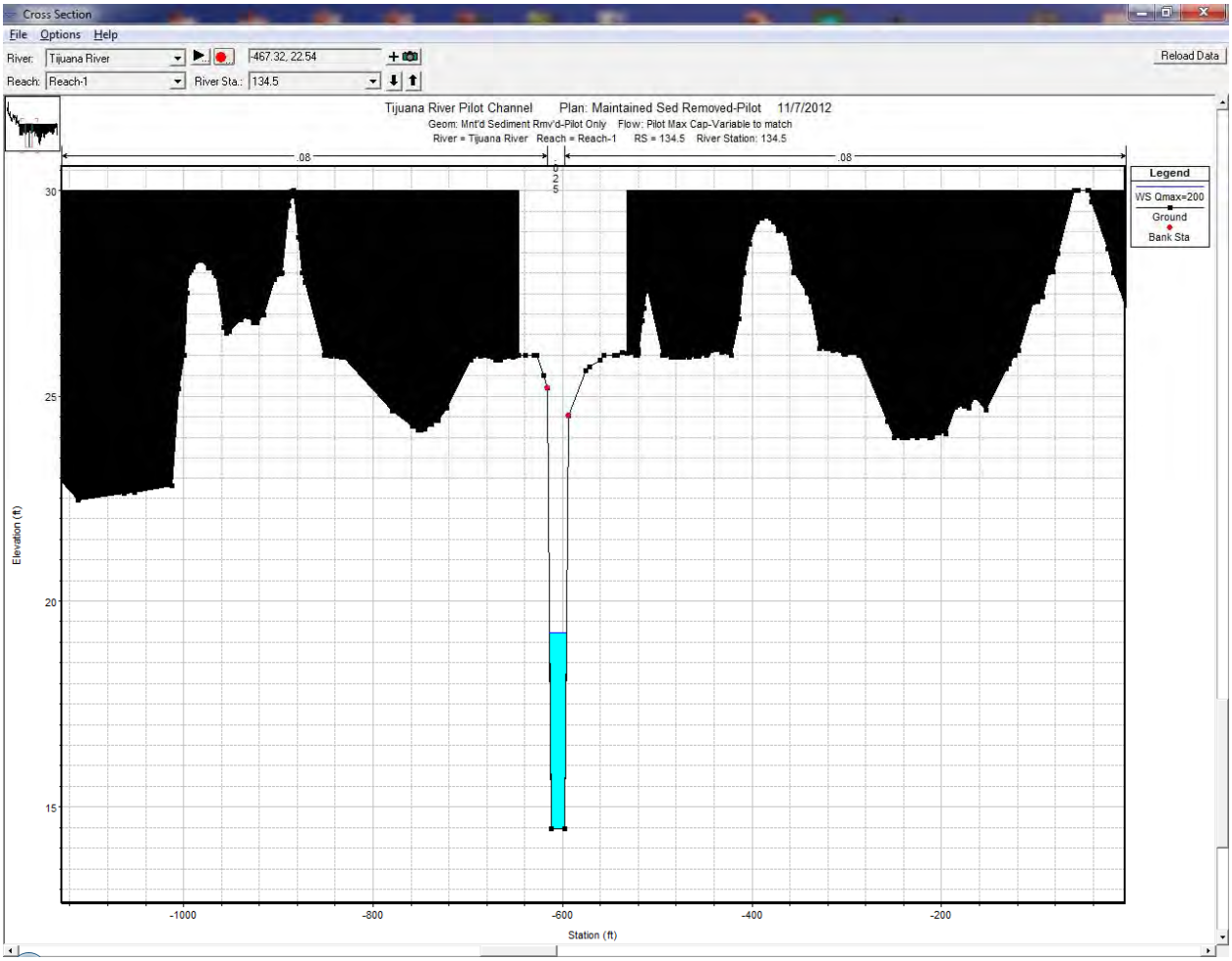

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14856 BR U
347.06, 19.80
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.08
.07
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)
40
35
30
25
20
15
-1000
-500
0
500
1000
1500

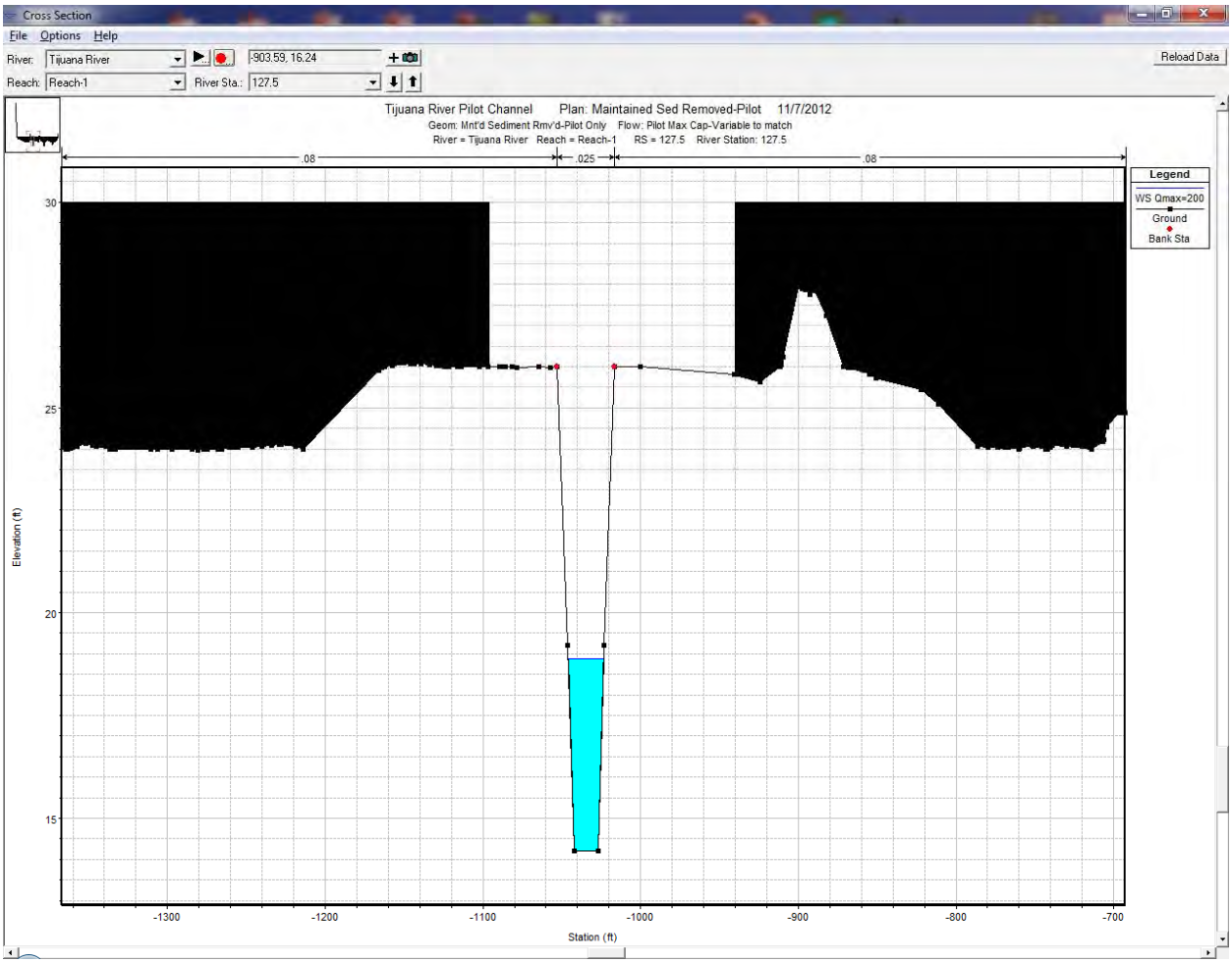

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14856 BR D
456.90, 21.44
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 14856 BR Hollister StreetStructure ID: SD_TJR29Detailed
.07
.035
.08
.08
.05
.05
.07
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)
40
35
30
25
20
15
-1000
-500
0
500
1000
1500

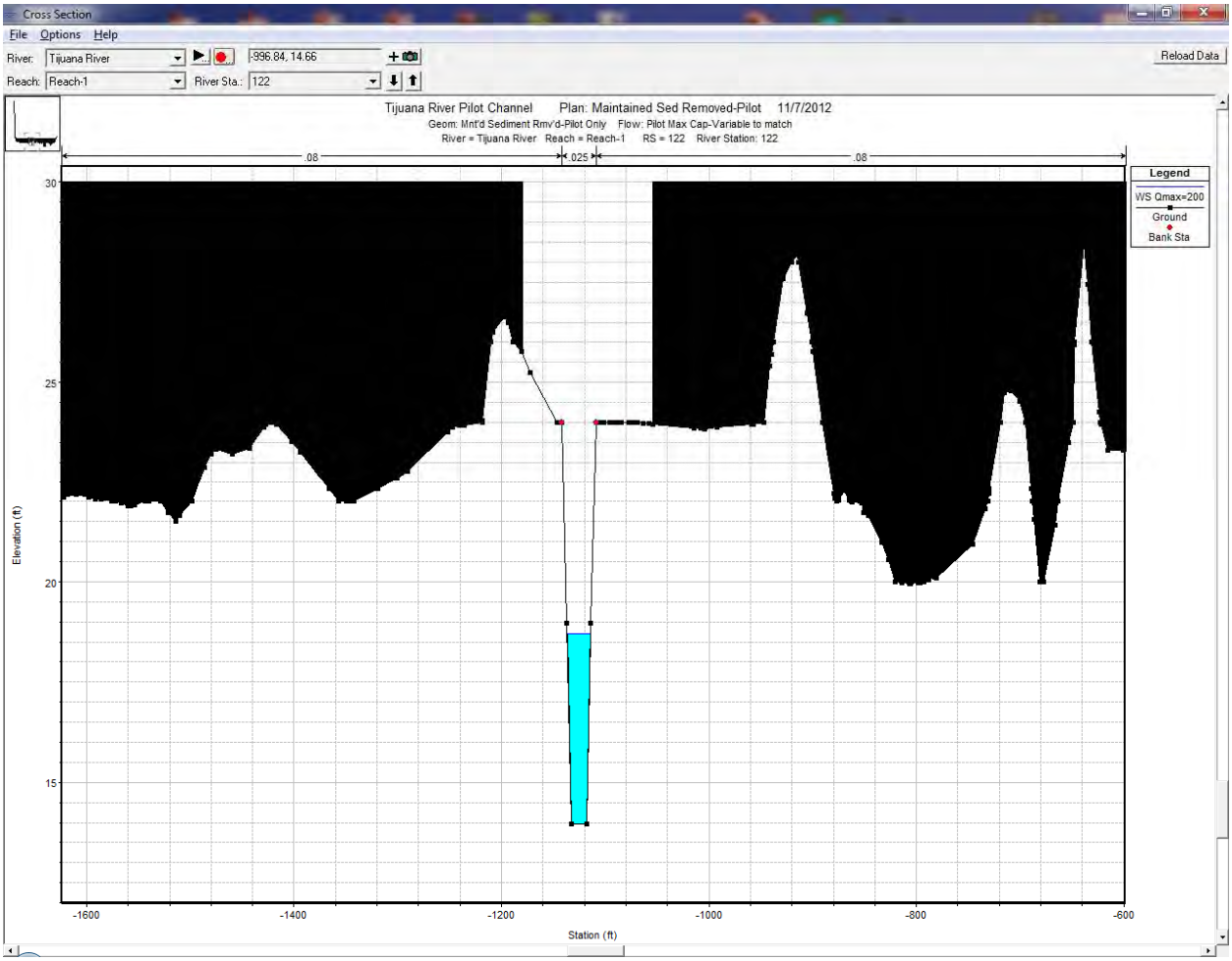

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14688
158.65, 18.85
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 14688 River Station: 14688
.07
.035
.08
.08
.05
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

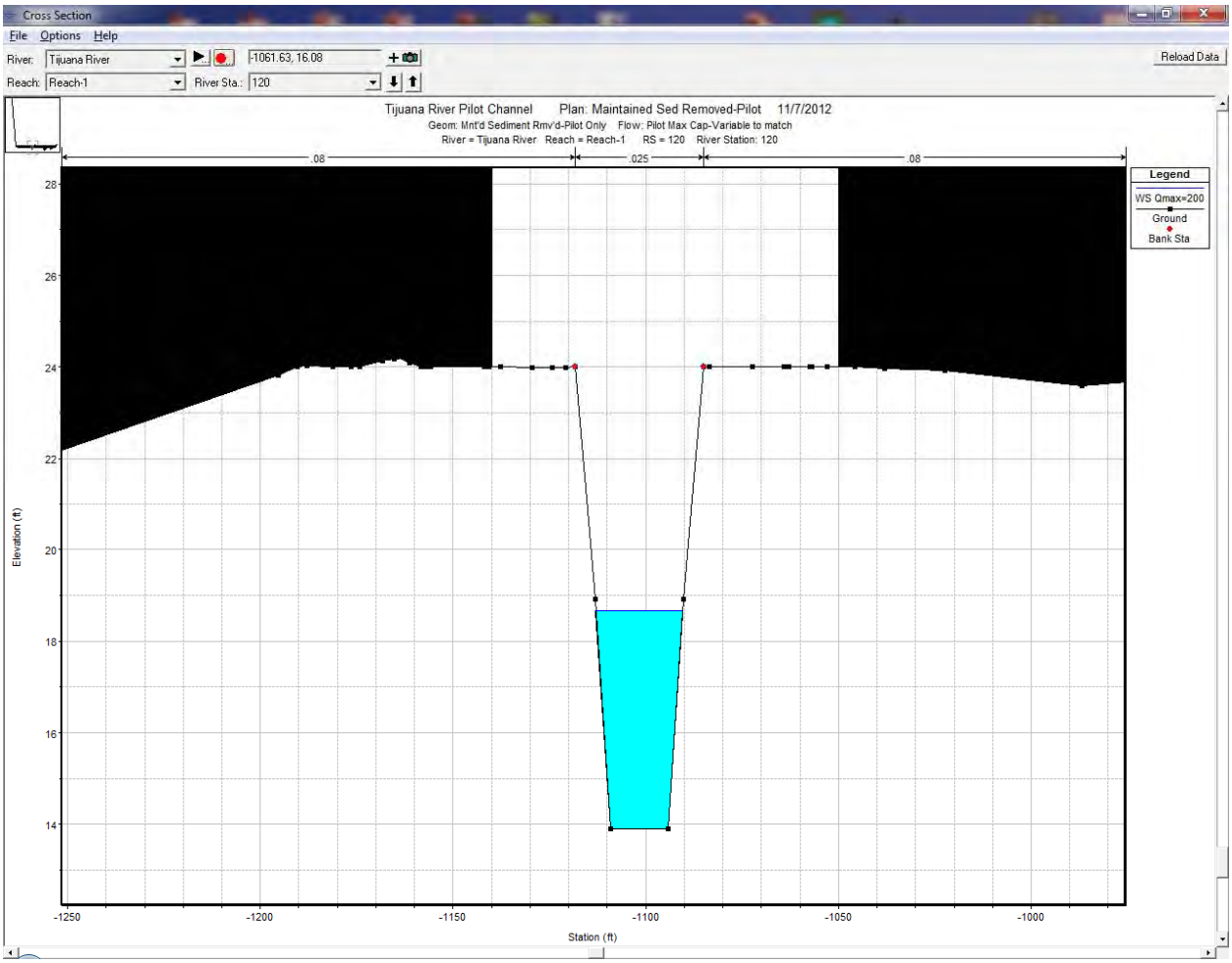

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 14541
189.19, 19.28
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 14541 River Station: 14541
.035
.08
.025
.08
.05
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

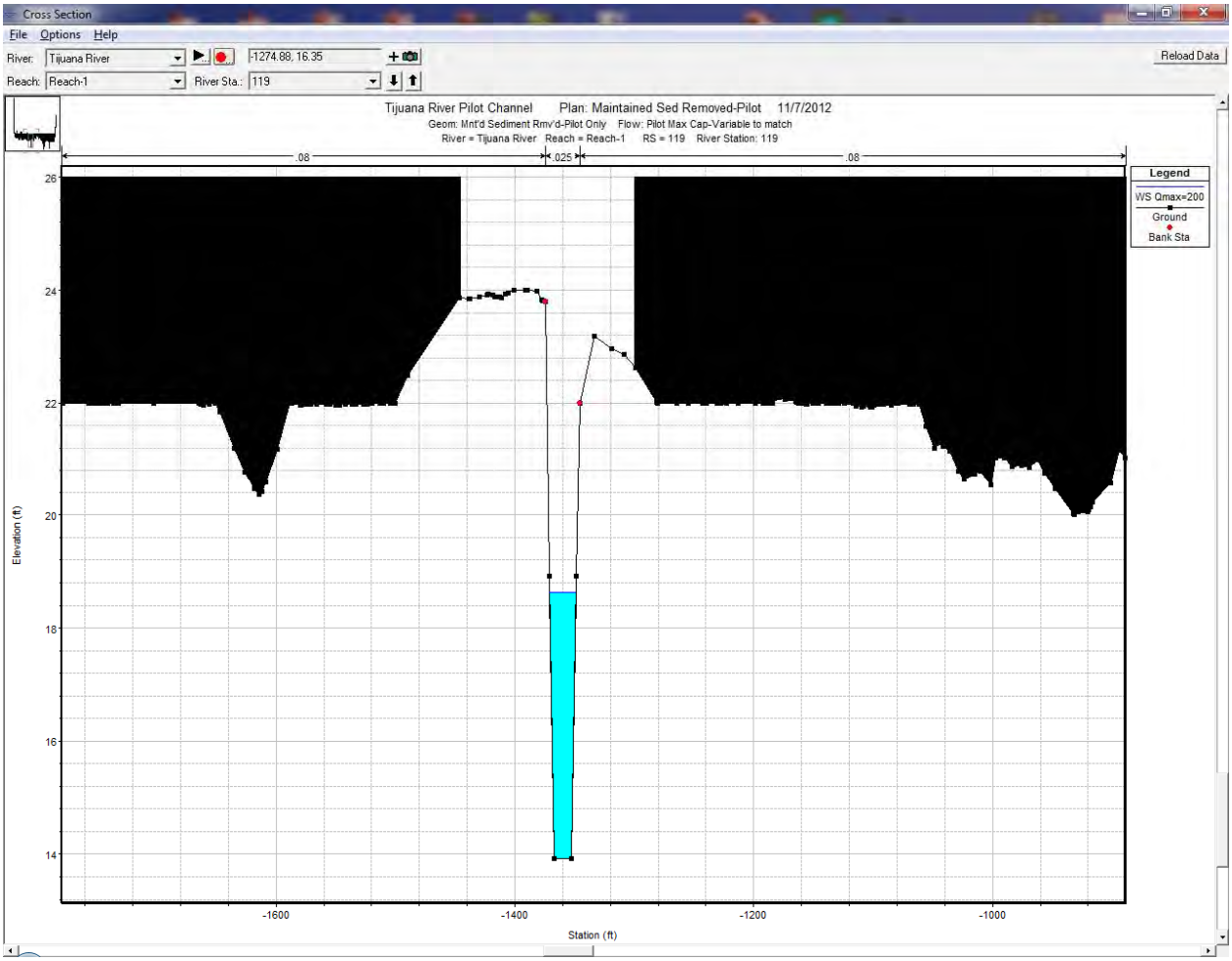

Cross Section
File Options Help
River: Tijuana River
-366.21, 19.15
Reach: Reach-1
River Sta.: 13805
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 13805 River Station: 13805
.035
.08
.025
.08
.05
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

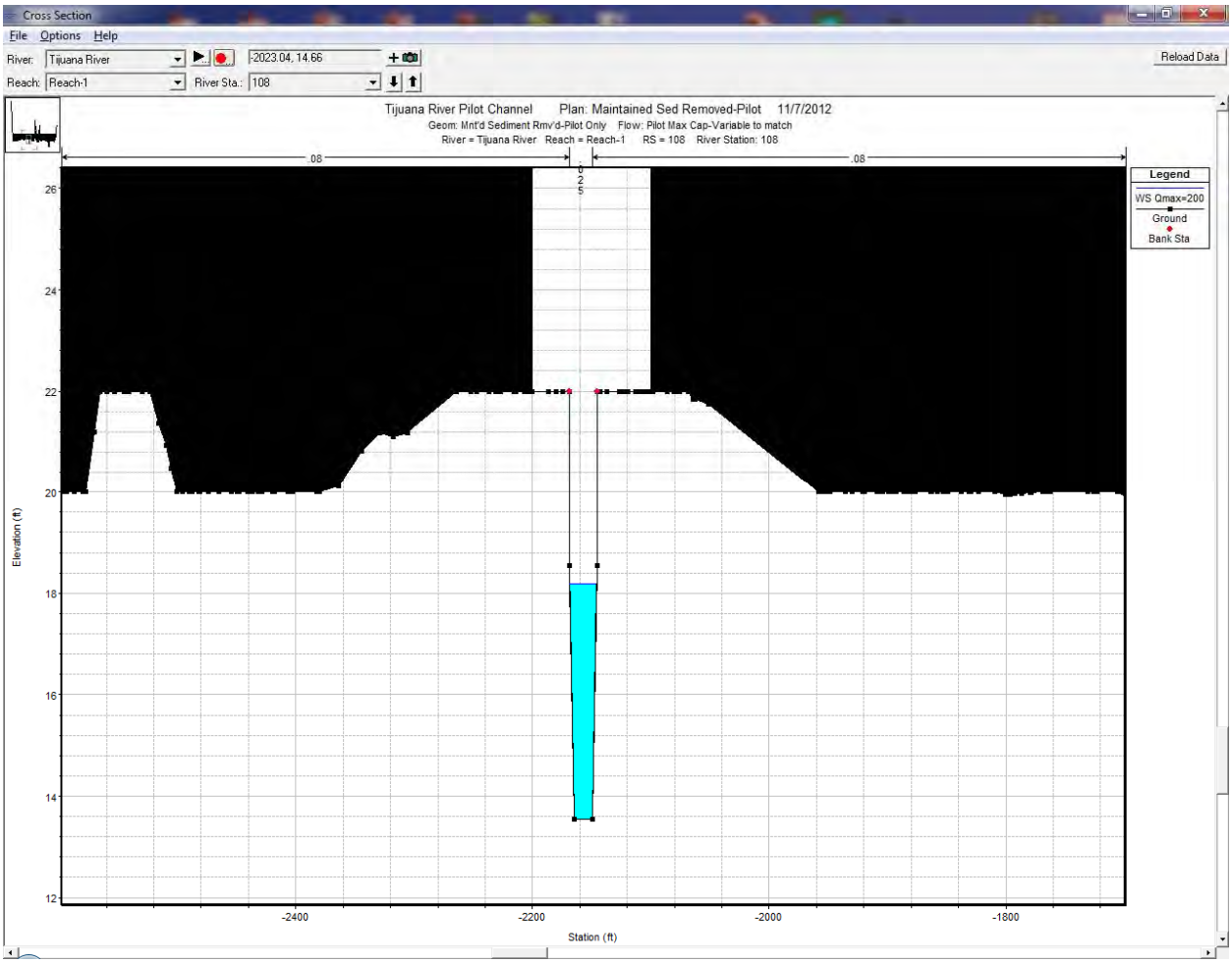

Cross Section
File Options Help
River: Tijuana River
-467.32, 22.54
Reach: Reach-1
River Sta.: 134.5
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 134.5 River Station: 134.5
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

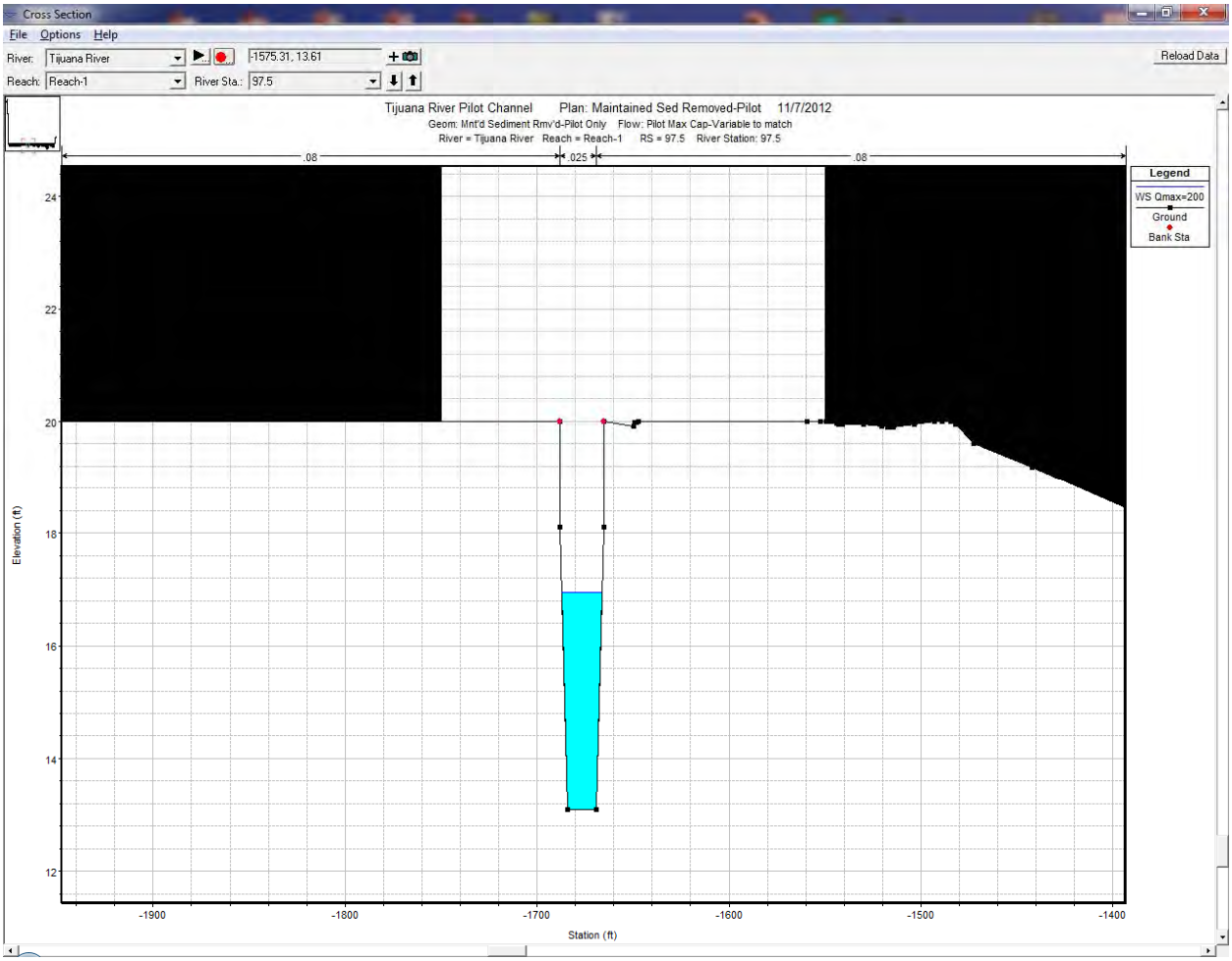

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 127.5
-903.59, 16.24
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 127.5 River Station: 127.5
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
30
25
20
15
Elevation (ft)
-1300
-1200
-1100
-1000
-900
-800
-700
Station (ft)

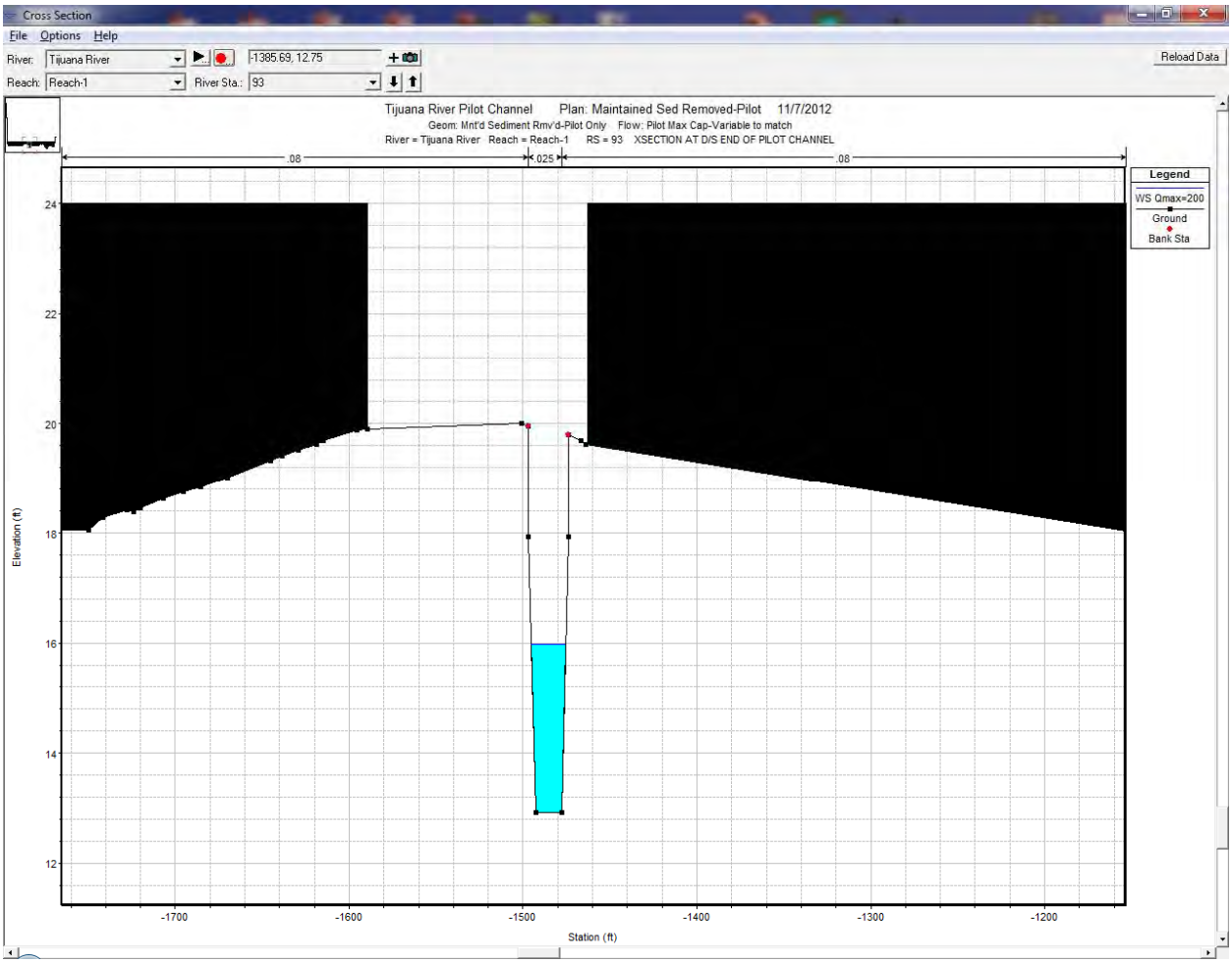

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 122
-996.84, 14.66
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 122 River Station: 122
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
30
25
20
15
Elevation (ft)
-1600
-1400
-1200
-1000
-800
-600
Station (ft)

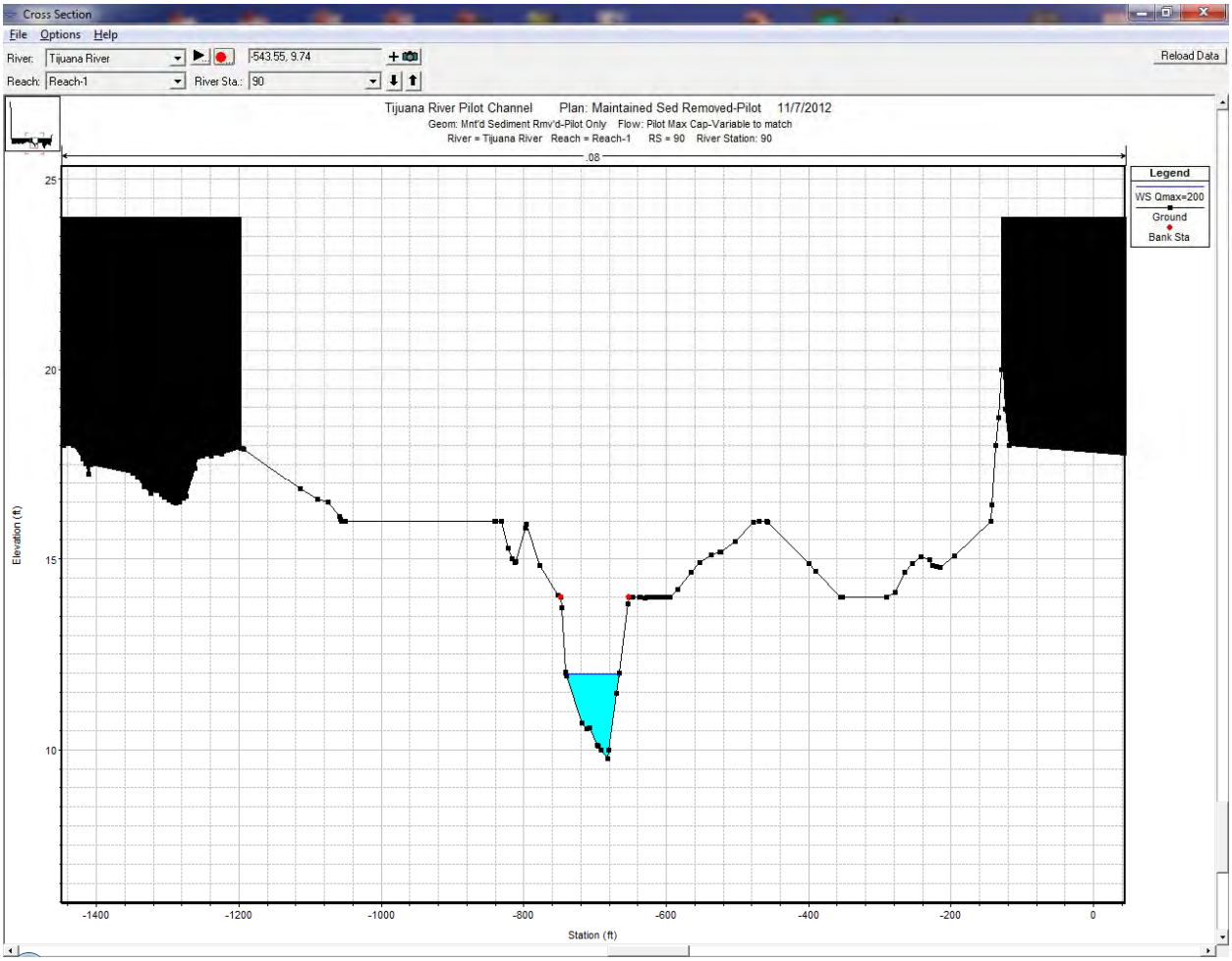

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 120
-1061.63, 16.08
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 120 River Station: 120
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

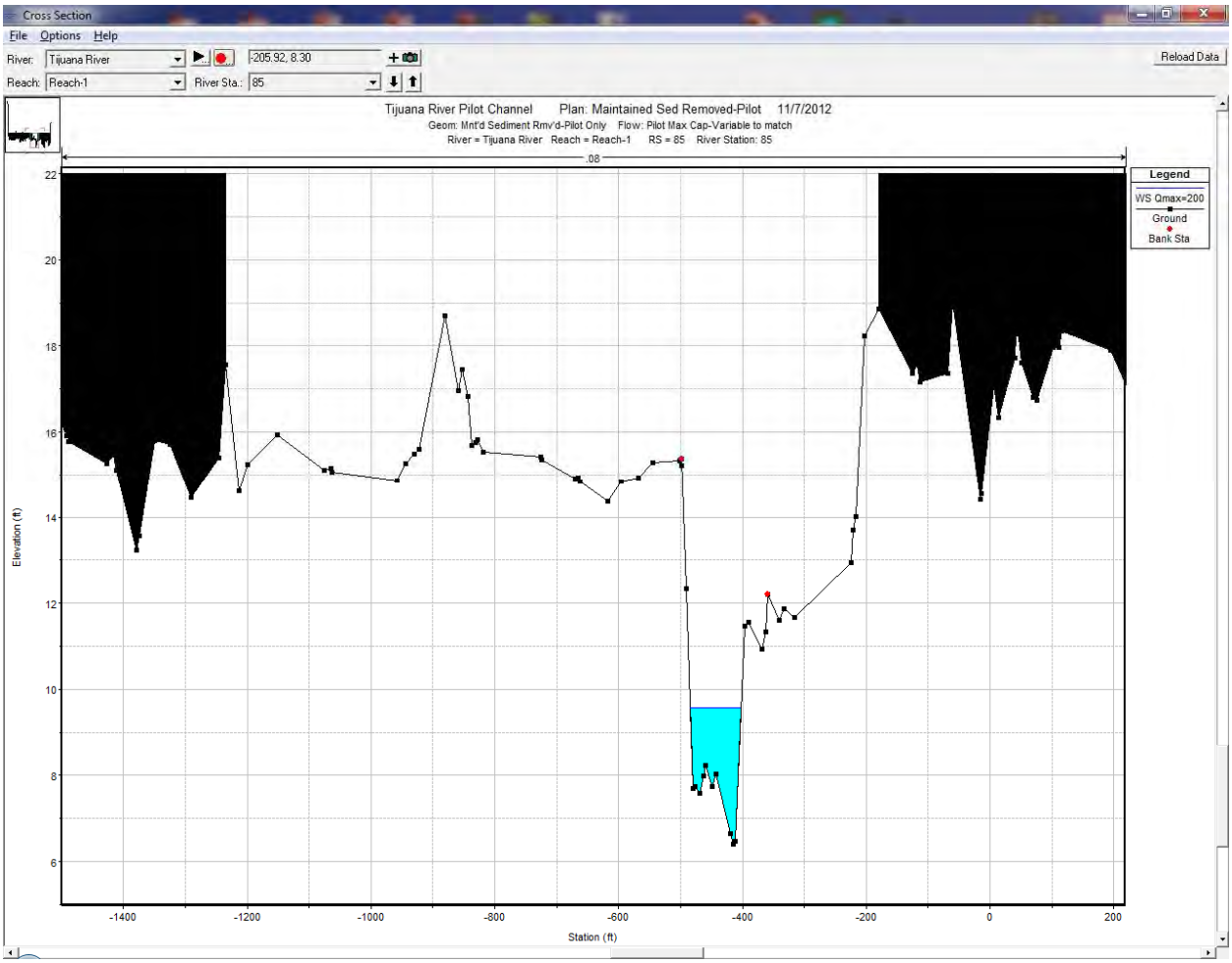

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 119
-1274.88, 16.35
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 119 River Station: 119
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

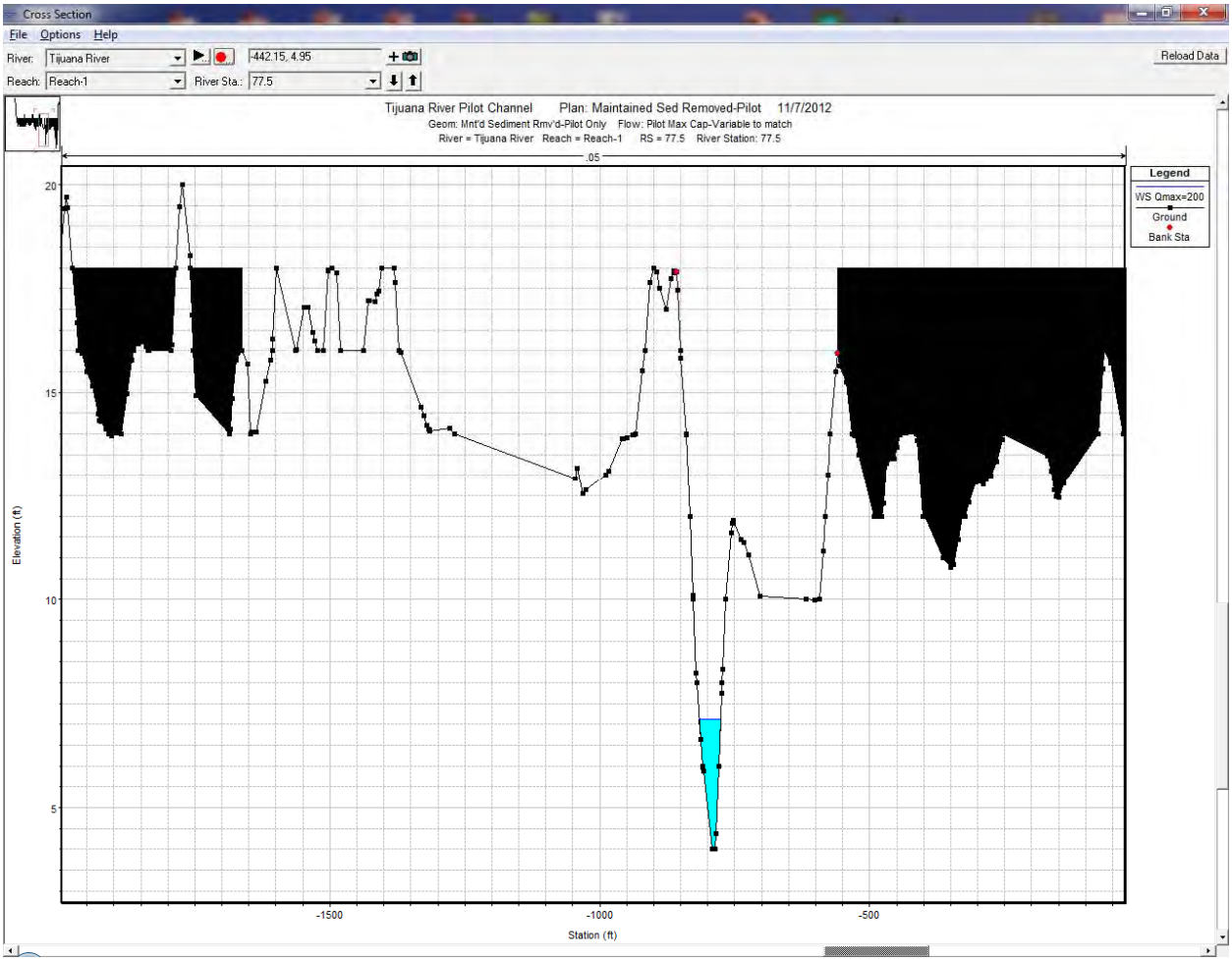

Cross Section
File Options Help
River: Tijuana River
-2023.04, 14.66
Reach: Reach-1
River Sta.: 108
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 108 River Station: 108
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)
26
24
22
20
18
16
14
12
-2400
-2200
-2000
-1800


Cross Section
File Options Help
River: Tijuana River
-1575.31, 13.61
Reach: Reach-1
River Sta.: 97.5
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 97.5 River Station: 97.5
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)
24
22
20
18
16
14
12
-1900
-1800
-1700
-1600
-1500
-1400


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 93
-1385.69, 12.75
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 93 XSECTION AT D/S END OF PILOT CHANNEL
.08
.025
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

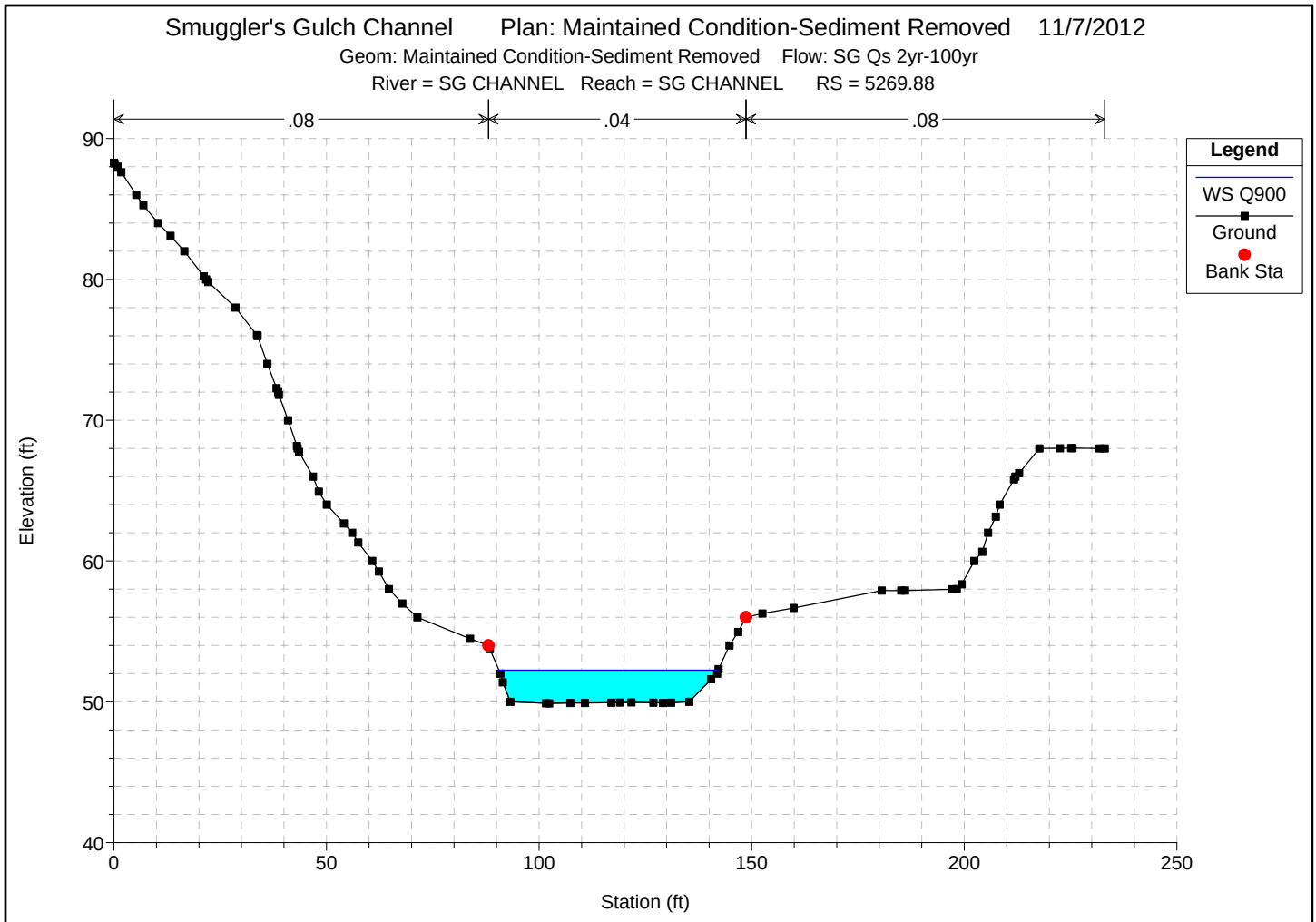

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 90
-543.55, 9.74
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 90 River Station: 90
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

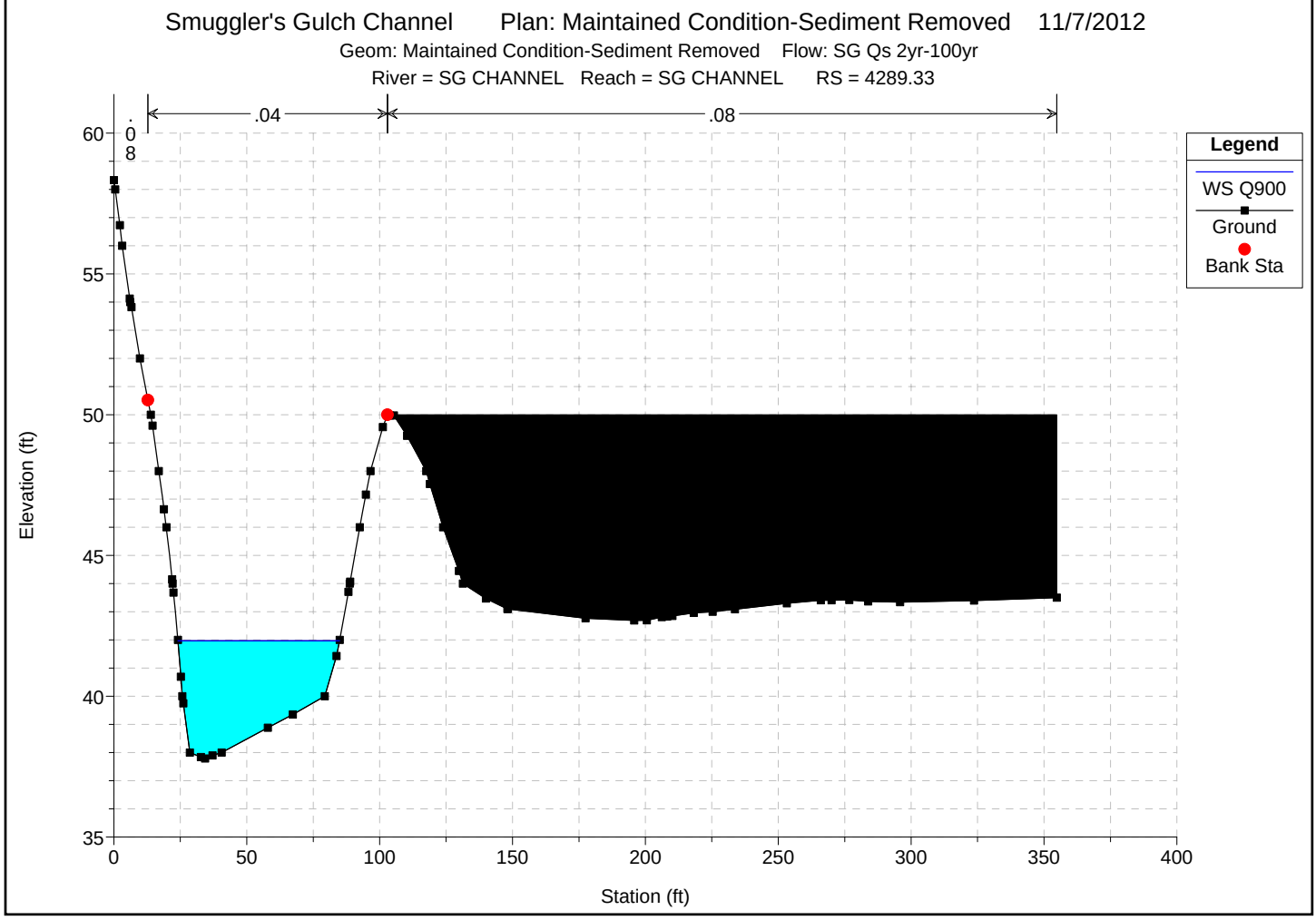

Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 85
-205.92, 8.30
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 85 River Station: 85
.08
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)


Cross Section
File Options Help
River: Tijuana River
Reach: Reach-1
River Sta.: 77.5
-442.15, 4.95
Reload Data
Tijuana River Pilot Channel Plan: Maintained Sed Removed-Pilot 11/7/2012
Geom: Mnt'd Sediment Rmv'd-Pilot Only Flow: Pilot Max Cap-Variable to match
River = Tijuana River Reach = Reach-1 RS = 77.5 River Station: 77.5
.05
Legend
WS Qmax=200
Ground
Bank Sta
Elevation (ft)
Station (ft)

HEC-RAS Plan: Mntn-Sed-Removed River: SG CHANNEL Reach: SG CHANNEL Profile: Q900

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
SG CHANNEL	5269.88	Q900	900.00	49.89	52.25	52.25	53.32	0.019031	8.29	108.60	51.59	1.01
SG CHANNEL	4289.33	Q900	900.00	37.79	41.97	40.82	42.36	0.004416	4.99	180.37	60.79	0.51
SG CHANNEL	4179.24	Q900	900.00	35.79	41.55	39.64	41.92	0.003463	4.88	184.28	52.37	0.46
SG CHANNEL	4099		Culvert									
SG CHANNEL	4028.11	Q900	900.00	29.99	38.81	37.84	40.06	0.002122	11.68	229.87	54.88	0.69
SG CHANNEL	4026.28*	Q900	900.00	29.77	36.87	36.87	39.60	0.004499	14.72	108.16	38.44	0.97
SG CHANNEL	4024.46*	Q900	900.00	29.55	34.57	35.83	39.06	0.010687	18.00	74.49	28.32	1.42
SG CHANNEL	4022.64*	Q900	900.00	29.33	33.40	35.04	38.77	0.016040	19.19	62.35	23.56	1.68
SG CHANNEL	4020.82*	Q900	900.00	29.11	32.54	34.36	38.54	0.021816	19.97	54.31	20.96	1.90
SG CHANNEL	4019.00*	Q900	900.00	28.88	31.81	33.74	38.34	0.028842	20.66	48.57	20.26	2.13
SG CHANNEL	4017.18*	Q900	900.00	28.66	31.20	33.19	38.15	0.036861	21.23	45.07	20.27	2.35
SG CHANNEL	4015.36*	Q900	900.00	28.44	30.67	32.64	37.97	0.045852	21.72	42.90	20.58	2.56
SG CHANNEL	4013.54*	Q900	900.00	28.22	30.21	32.15	37.79	0.055562	22.13	41.58	21.61	2.77
SG CHANNEL	4011.72	Q900	900.00	28.00	29.79	31.70	37.61	0.065729	22.45	40.75	23.19	2.96
SG CHANNEL	3962.20*	Q900	900.00	27.96	33.67	31.29	34.16	0.000986	5.66	176.55	39.18	0.42
SG CHANNEL	3912.68*	Q900	900.00	27.91	33.68	31.24	34.06	0.000867	4.99	196.15	44.09	0.39
SG CHANNEL	3863.17	Q900	900.00	27.87	33.66	31.43	34.00	0.000905	4.70	205.37	49.04	0.38
SG CHANNEL	3774.45	Q900	900.00	27.80	33.42	31.48	33.89	0.001265	5.50	173.57	42.83	0.45
SG CHANNEL	2623.27	Q900	900.00	23.73	32.90	27.64	33.16	0.000333	4.25	301.19	53.74	0.25
SG CHANNEL	2549.85	Q900	900.00	22.00	32.94	26.01	33.12	0.000153	3.62	411.41	63.27	0.19
SG CHANNEL	2500		Culvert									
SG CHANNEL	2489.75	Q900	900.00	22.00	29.18	25.54	29.44	0.000437	4.10	231.97	44.79	0.29
SG CHANNEL	2408.4	Q900	900.00	23.74	28.34	27.36	29.30	0.002686	7.90	124.99	36.53	0.67
SG CHANNEL	1551.01	Q900	900.00	20.00	23.98	23.98	25.96	0.005713	11.28	82.11	22.63	1.00

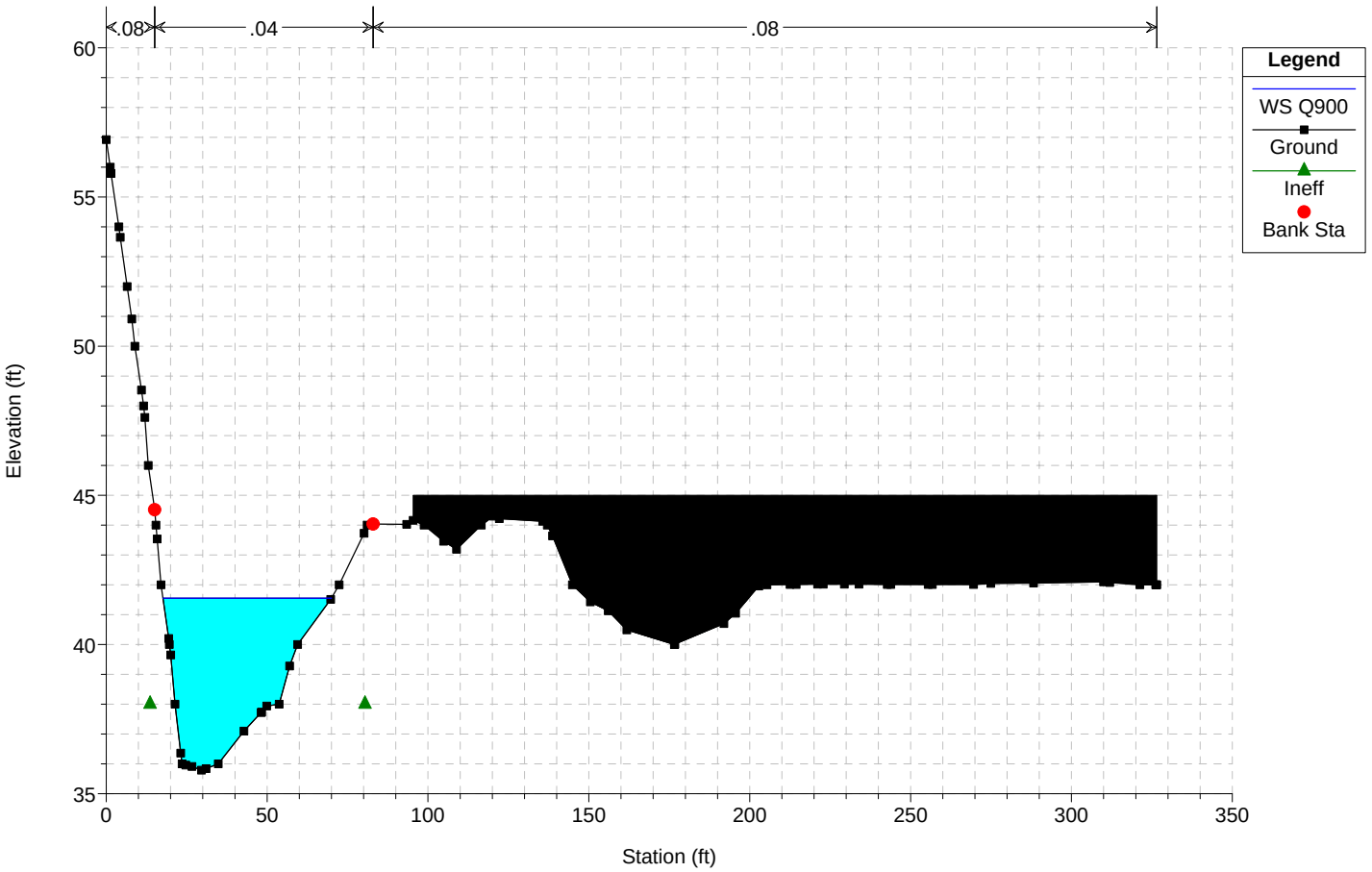

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 5269.88
.08
.04
.08
Legend
WS Q900
Ground
Bank Sta
Elevation (ft)
Station (ft)
90
80
70
60
50
40
0
50
100
150
200
250


Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4289.33
.08
.04
.08
Legend
WS Q900
Ground
Bank Sta
Elevation (ft)
Station (ft)
60
55
50
45
40
35
0
50
100
150
200
250
300
350
400

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

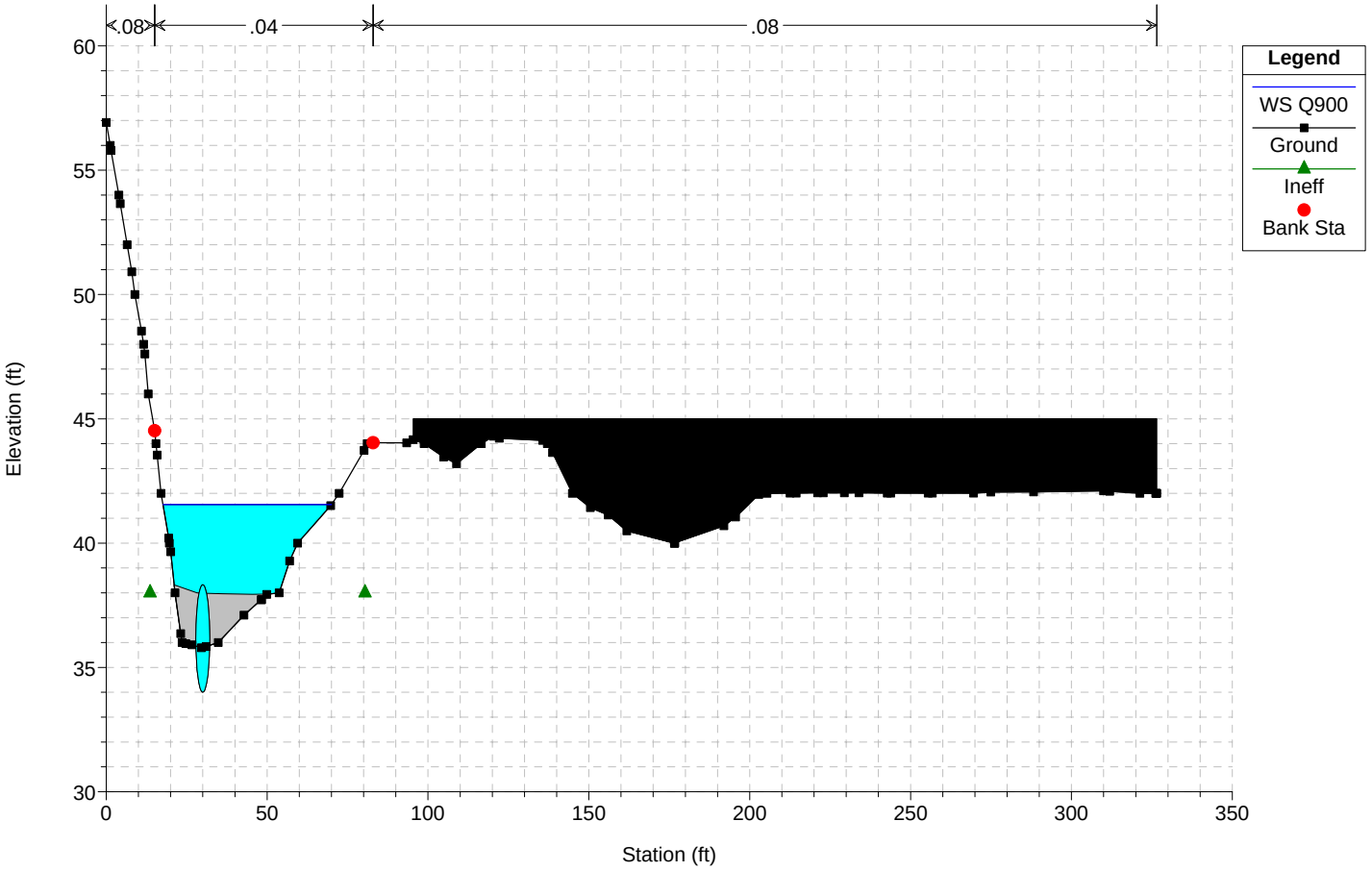
River = SG CHANNEL Reach = SG CHANNEL RS = 4179.24

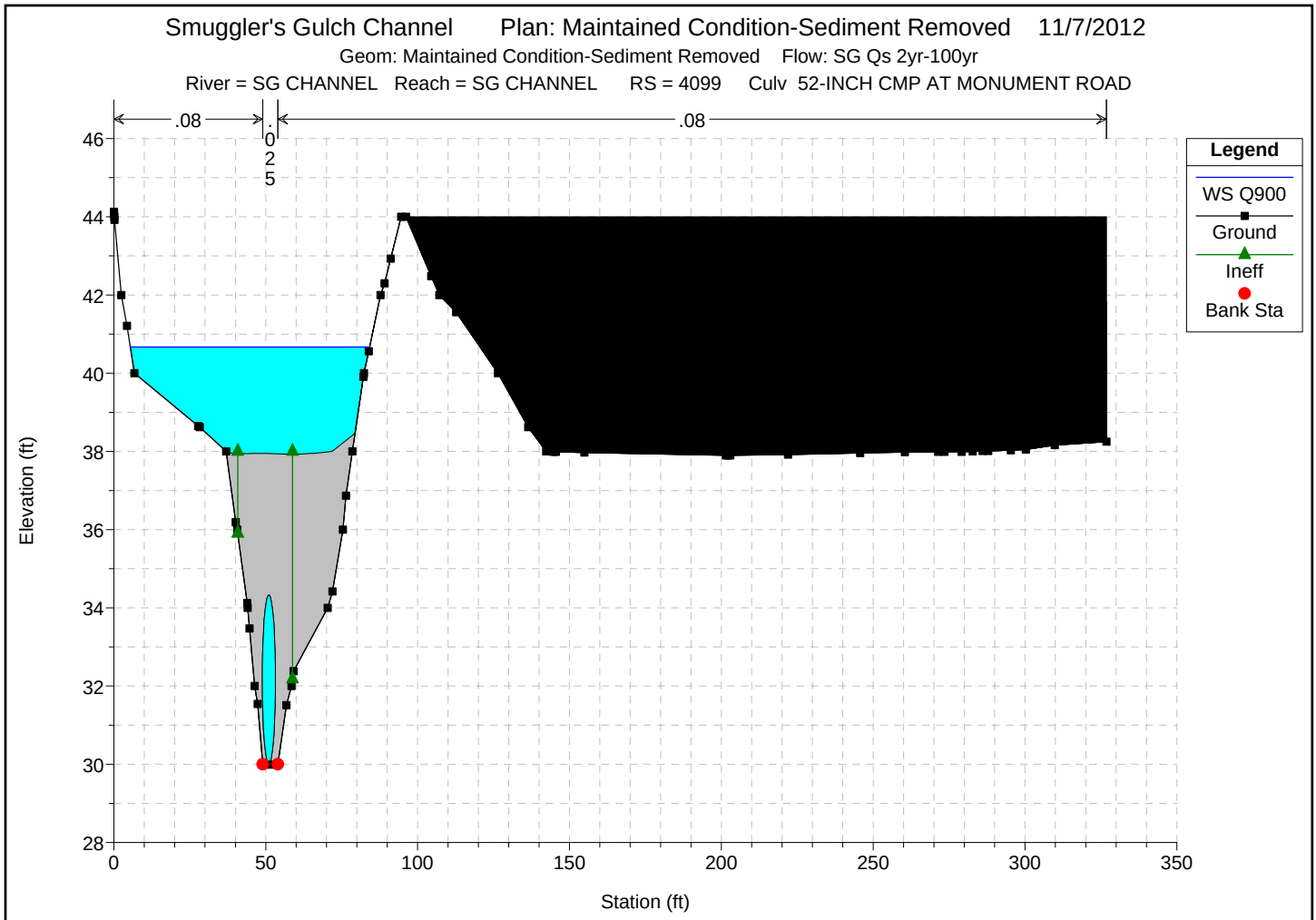


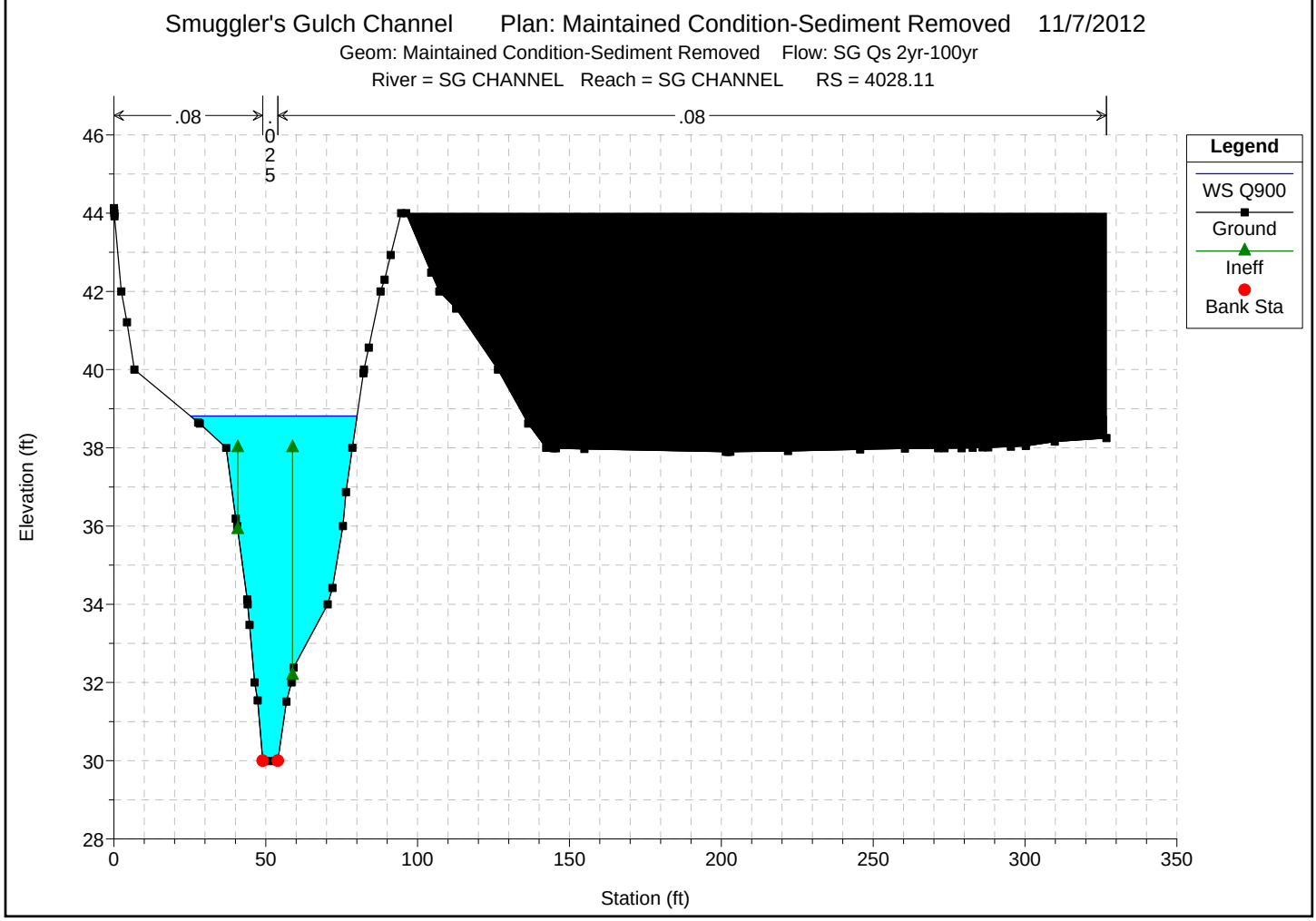
Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

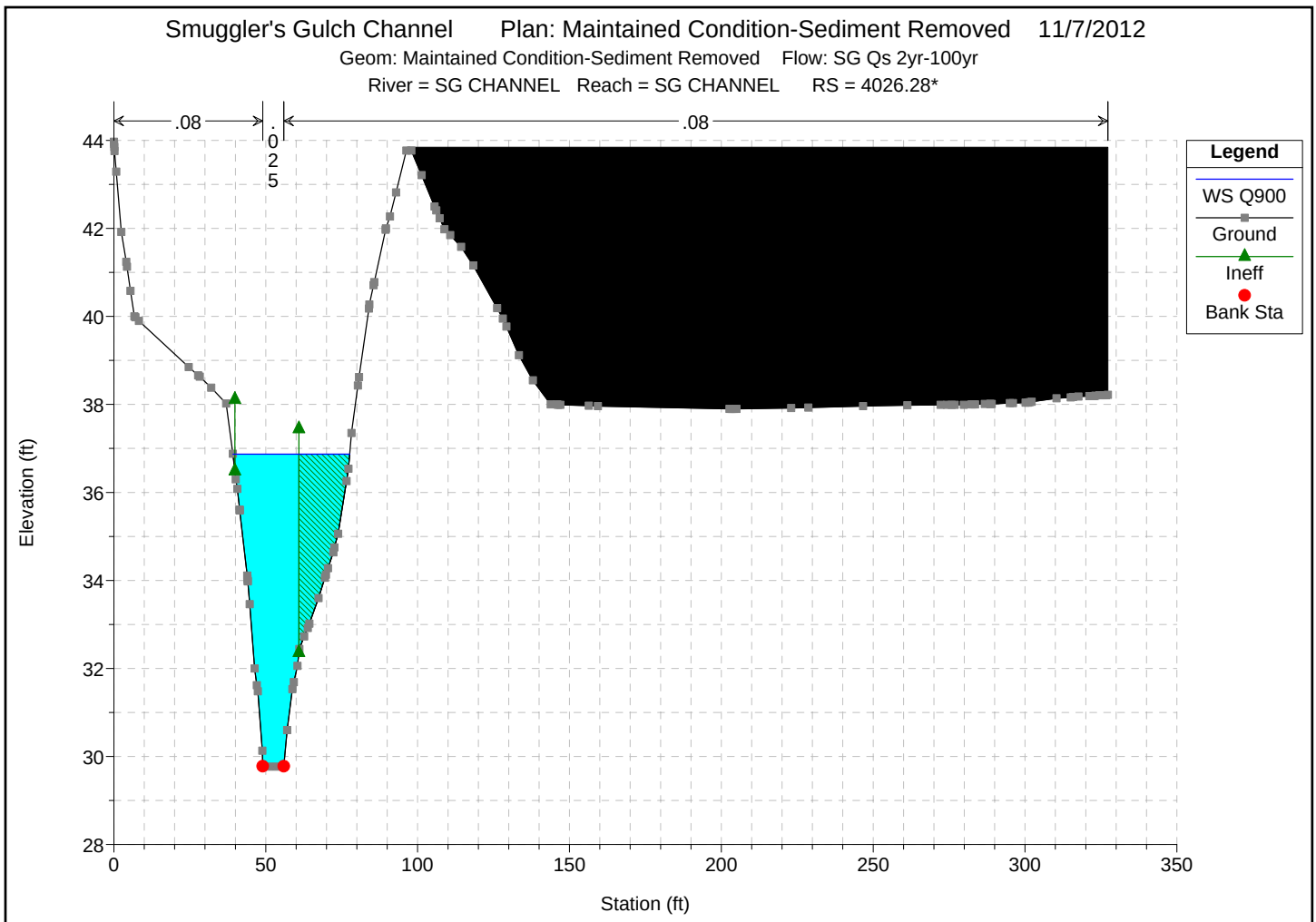
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

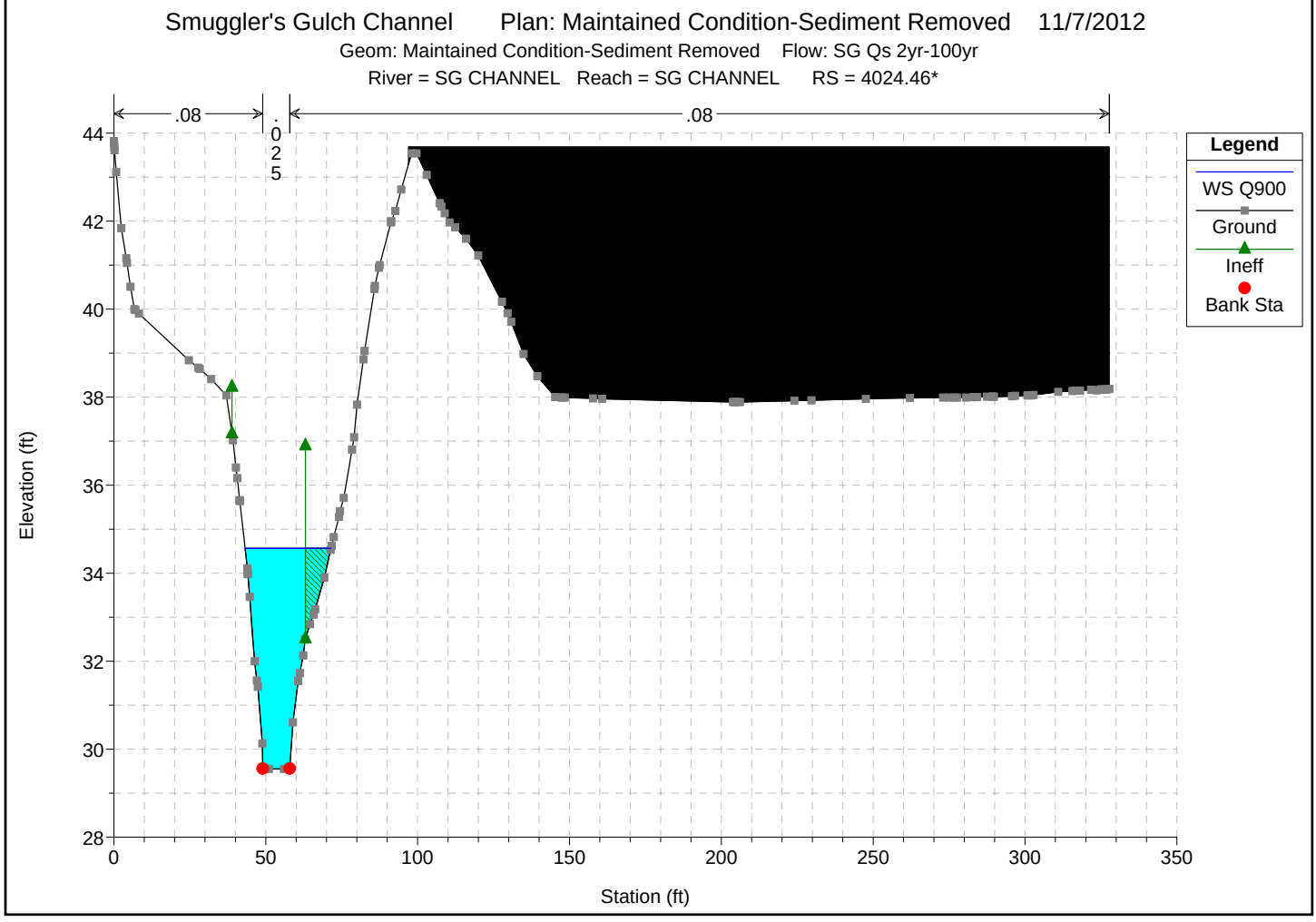
River = SG CHANNEL Reach = SG CHANNEL RS = 4099 Culv 52-INCH CMP AT MONUMENT ROAD

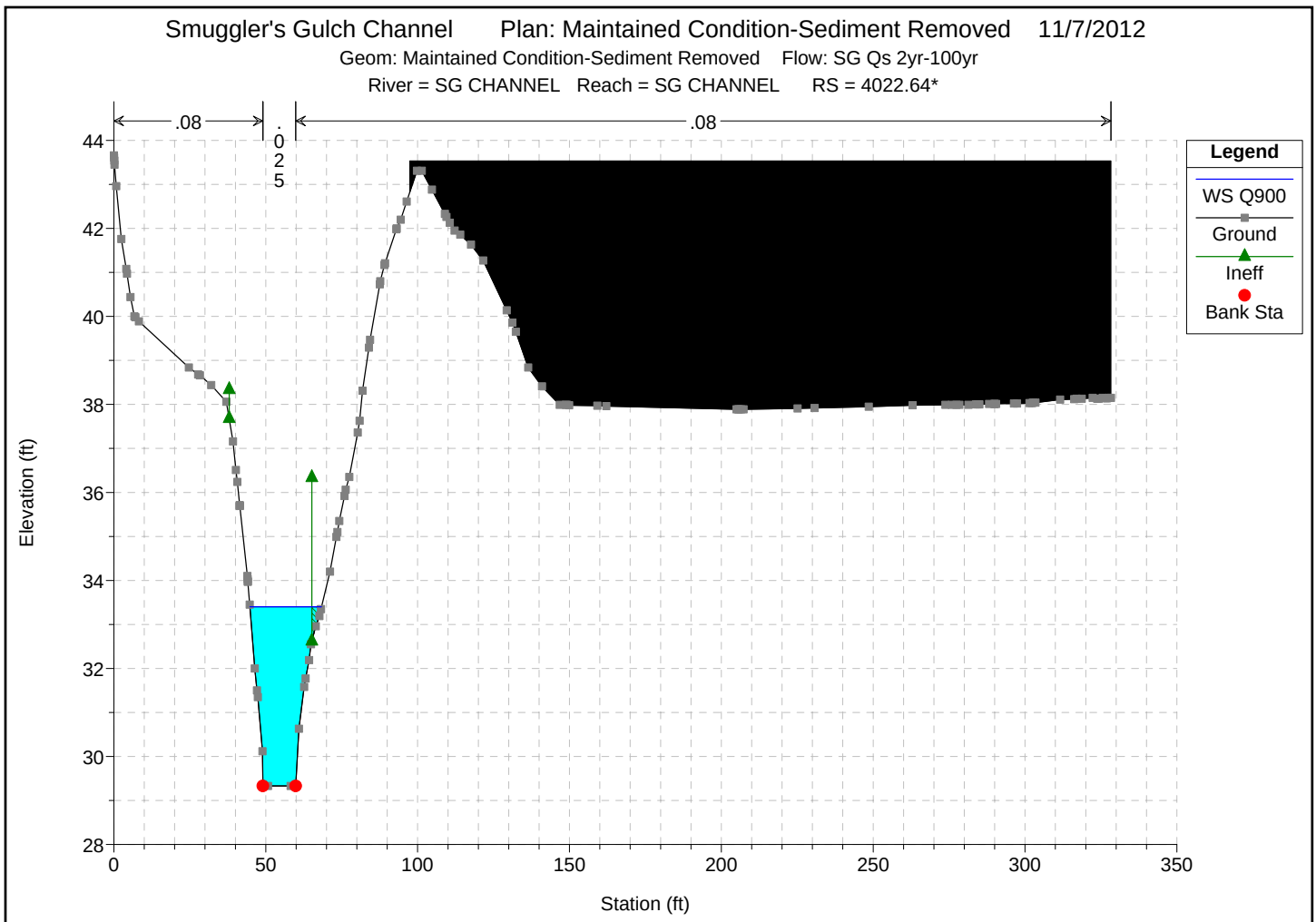


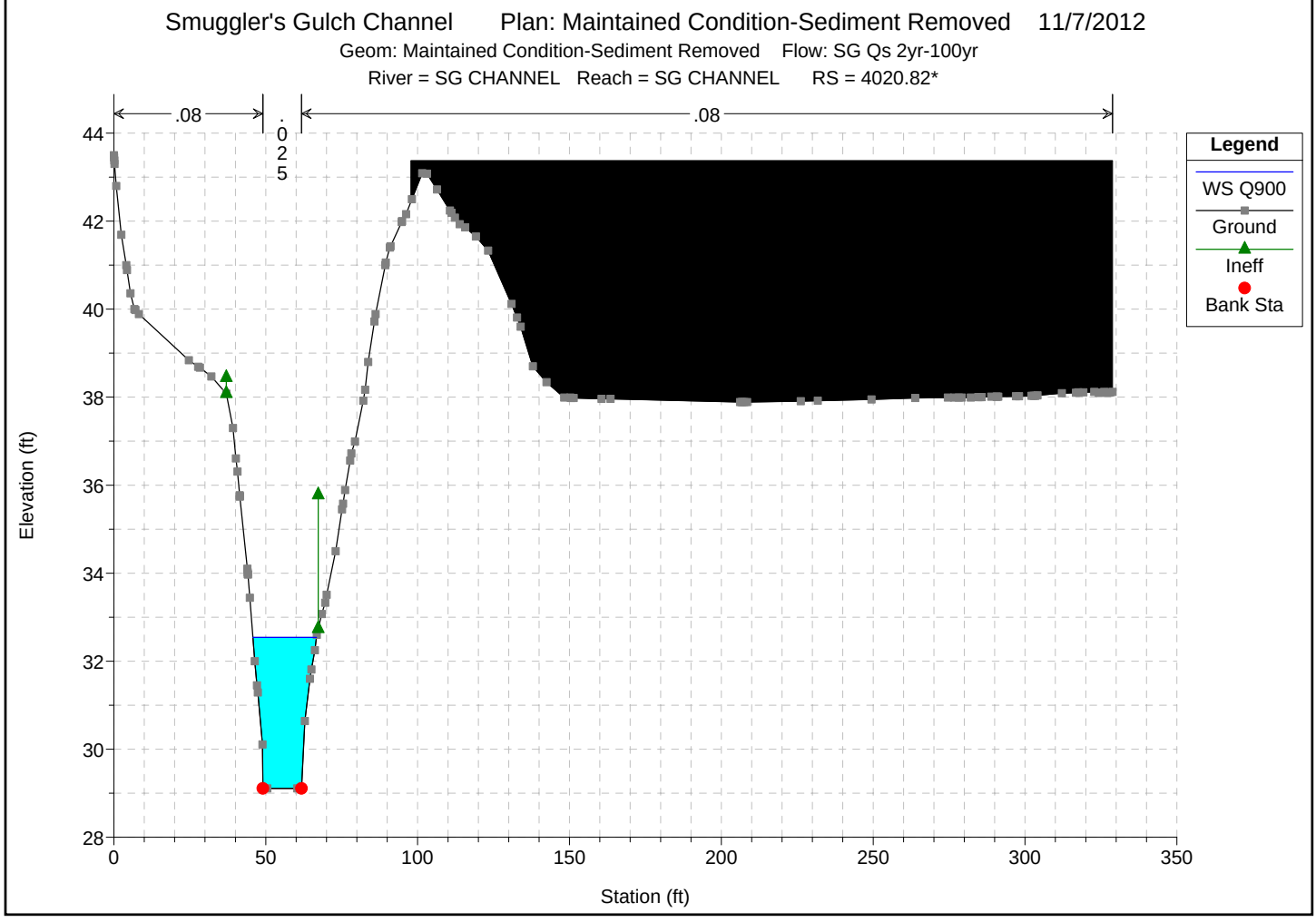

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4099 Culv 52-INCH CMP AT MONUMENT ROAD
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
46
0
50
100
150
200
250
300
350

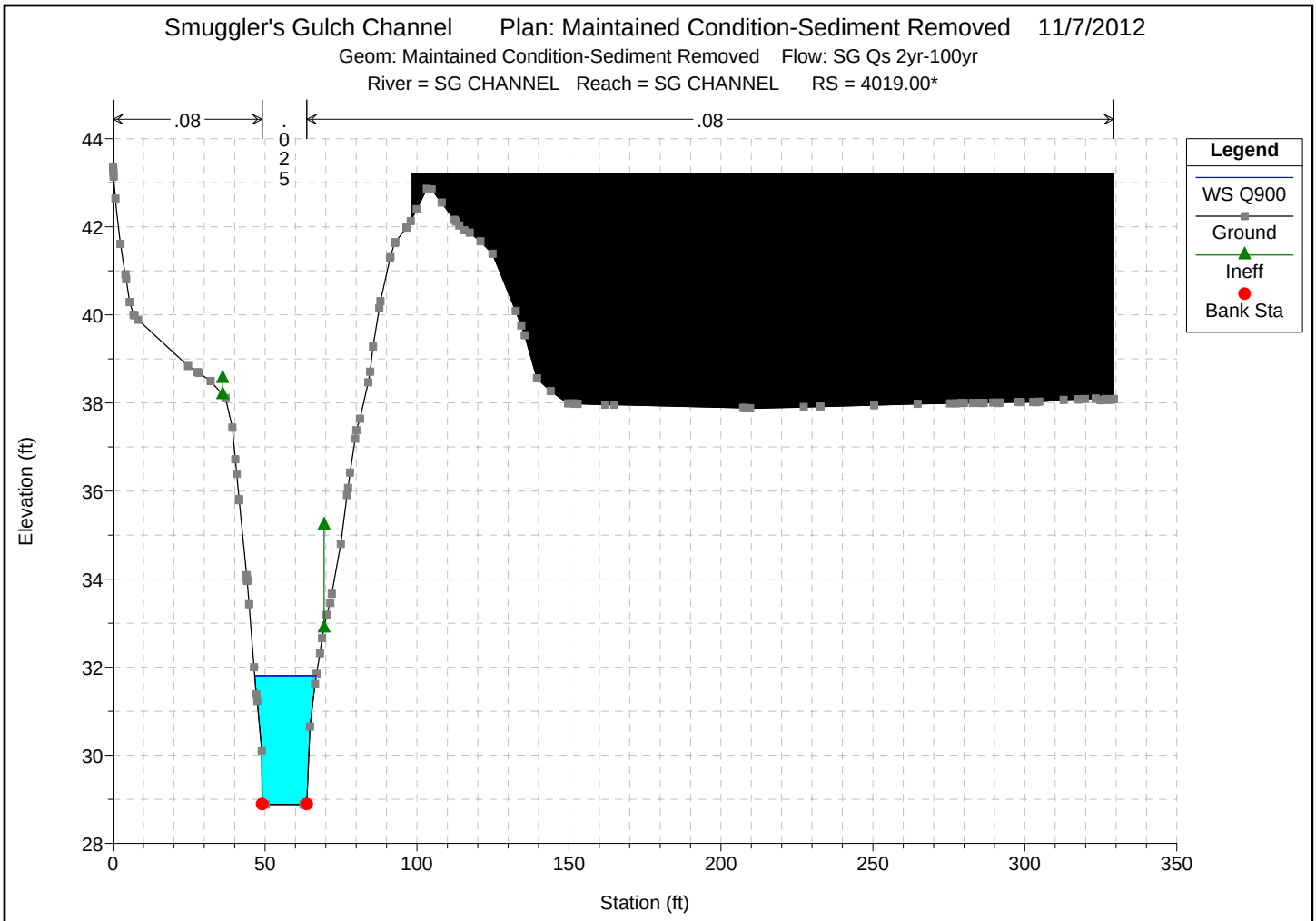

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4028.11
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
46
0
50
100
150
200
250
300
350

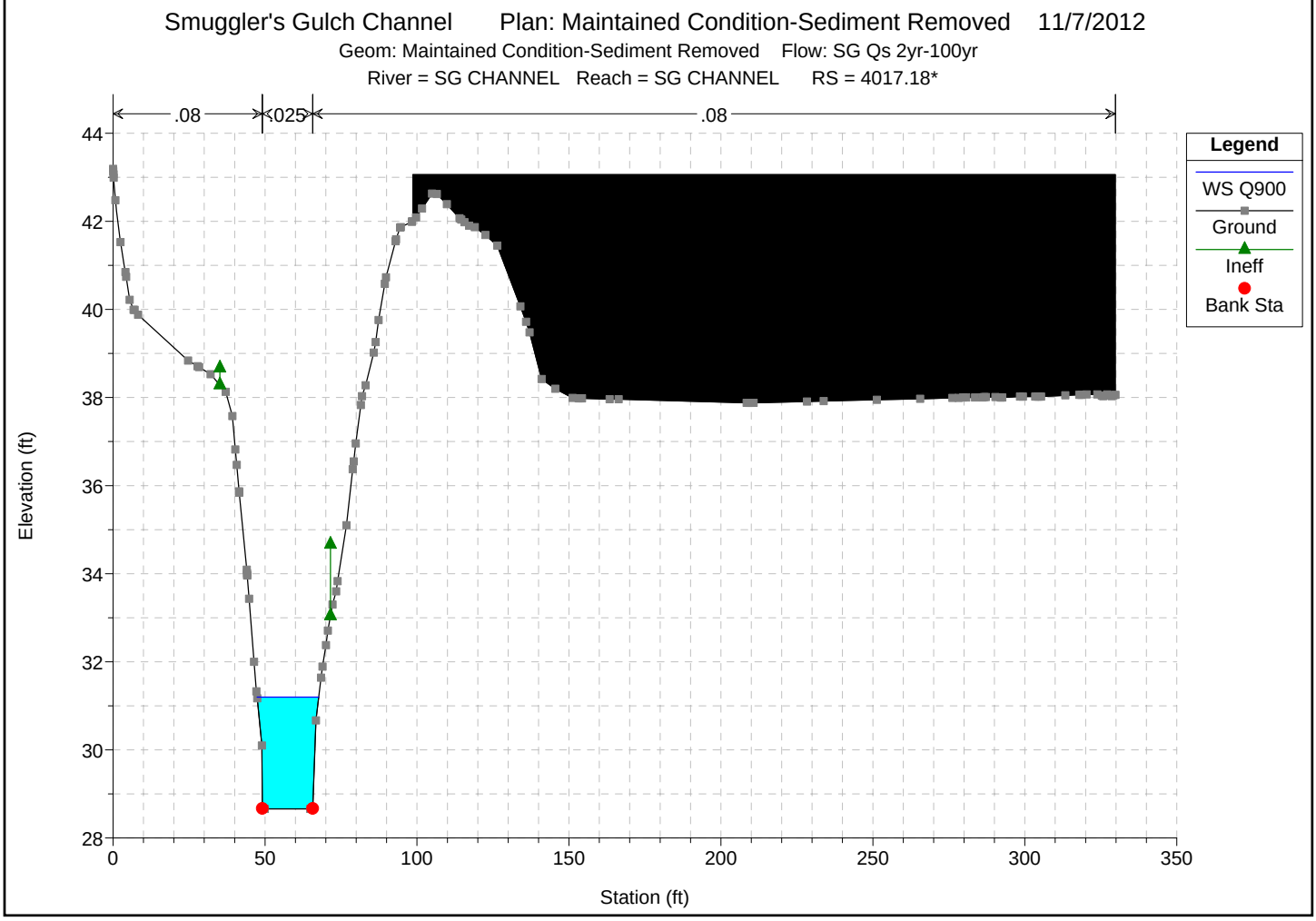

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4026.28*
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4024.46*
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4022.64*
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4020.82*
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
0
50
100
150
200
250
300
350

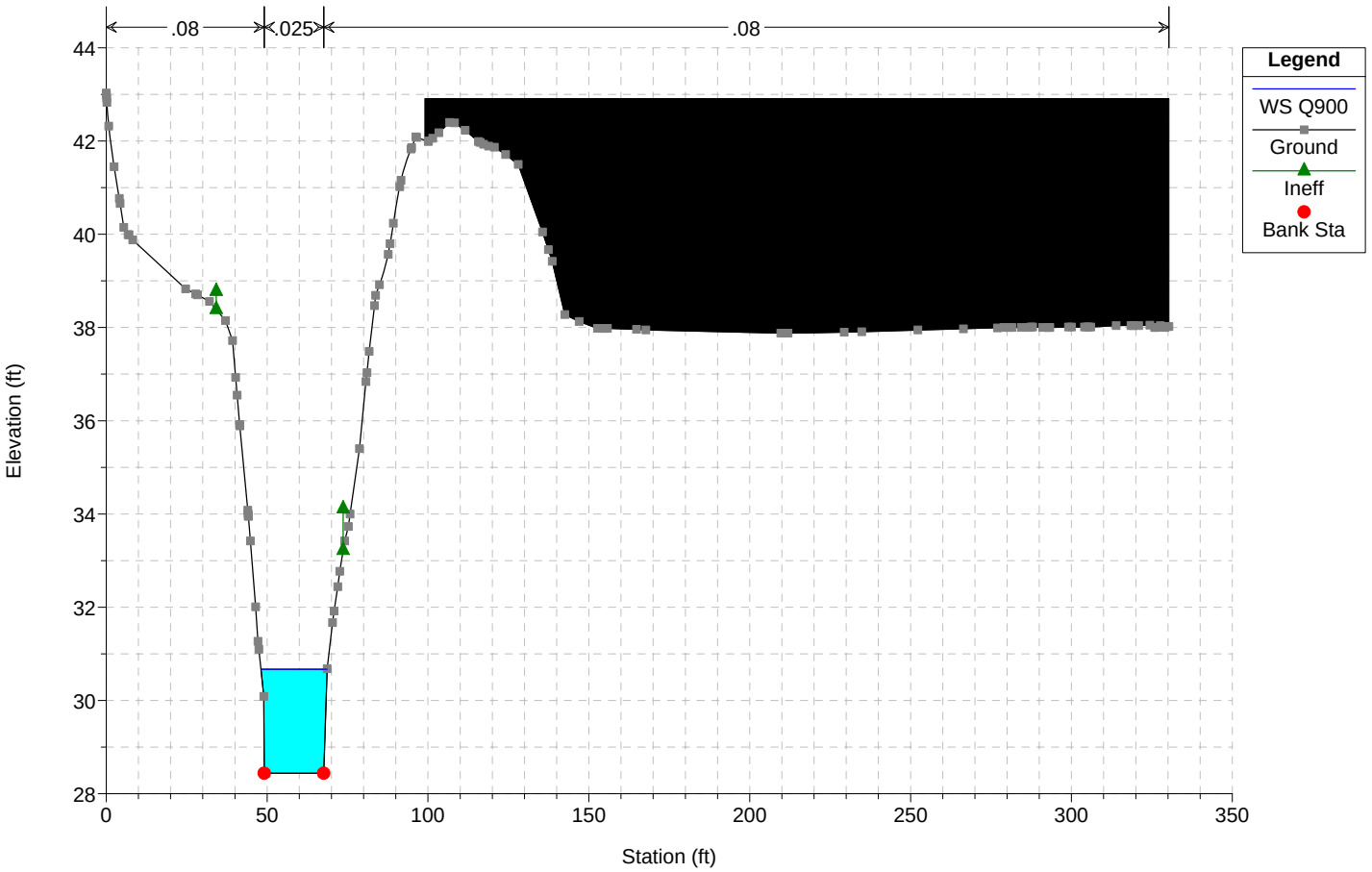

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4019.00*
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
0
50
100
150
200
250
300
350


Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4017.18*
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
28
30
32
34
36
38
40
42
44
0
50
100
150
200
250
300
350

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

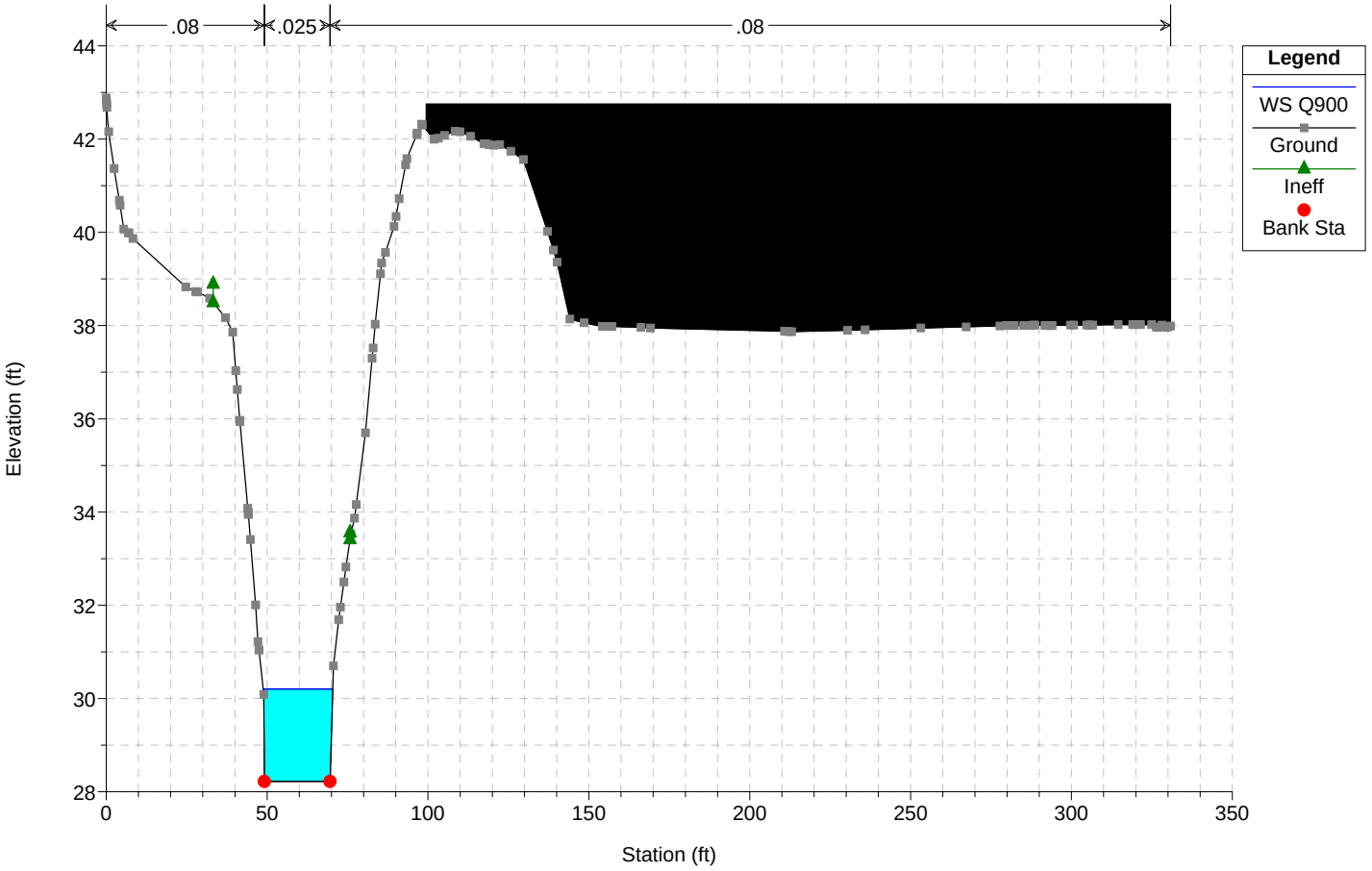
River = SG CHANNEL Reach = SG CHANNEL RS = 4015.36*

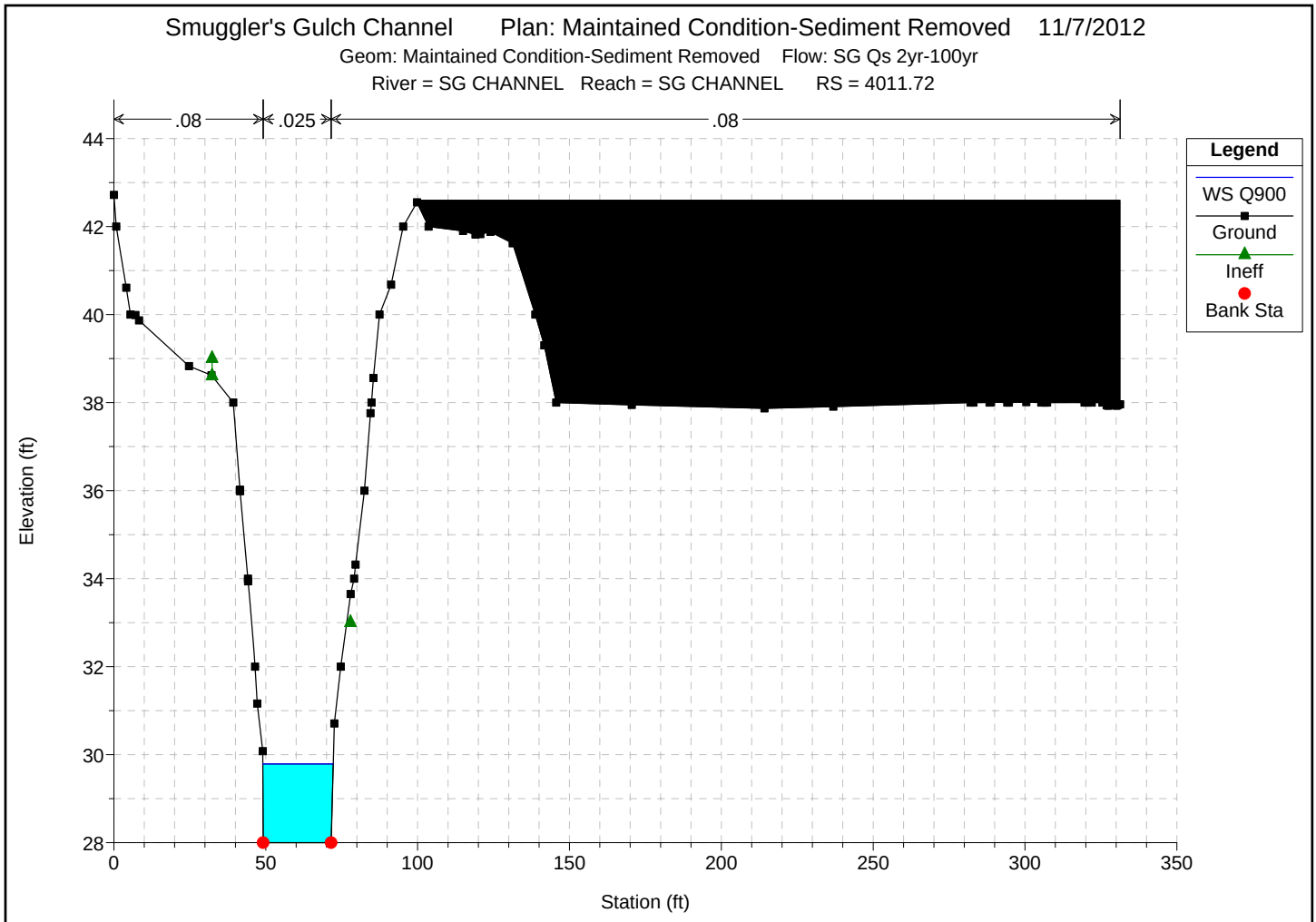


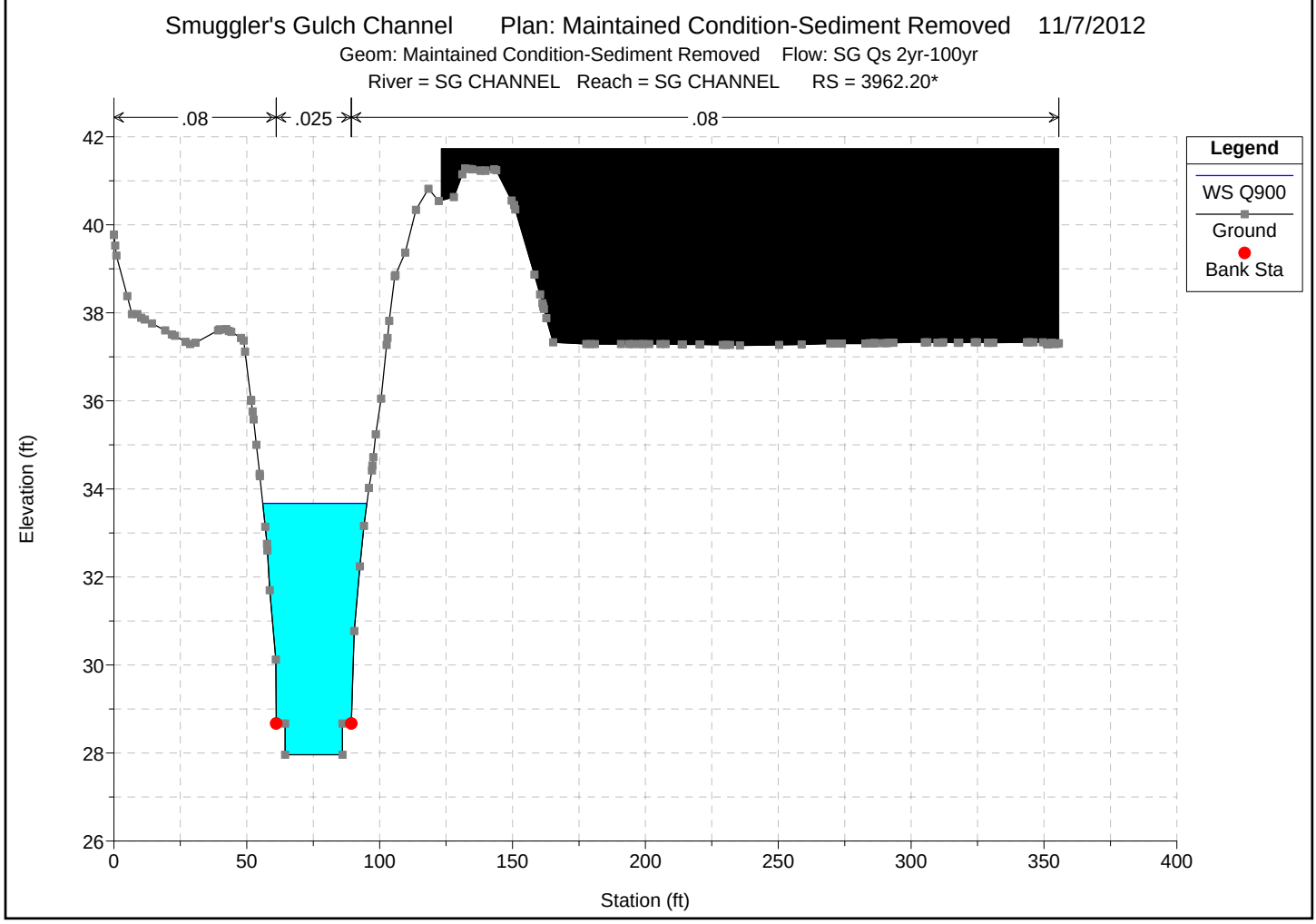
Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

River = SG CHANNEL Reach = SG CHANNEL RS = 4013.54*



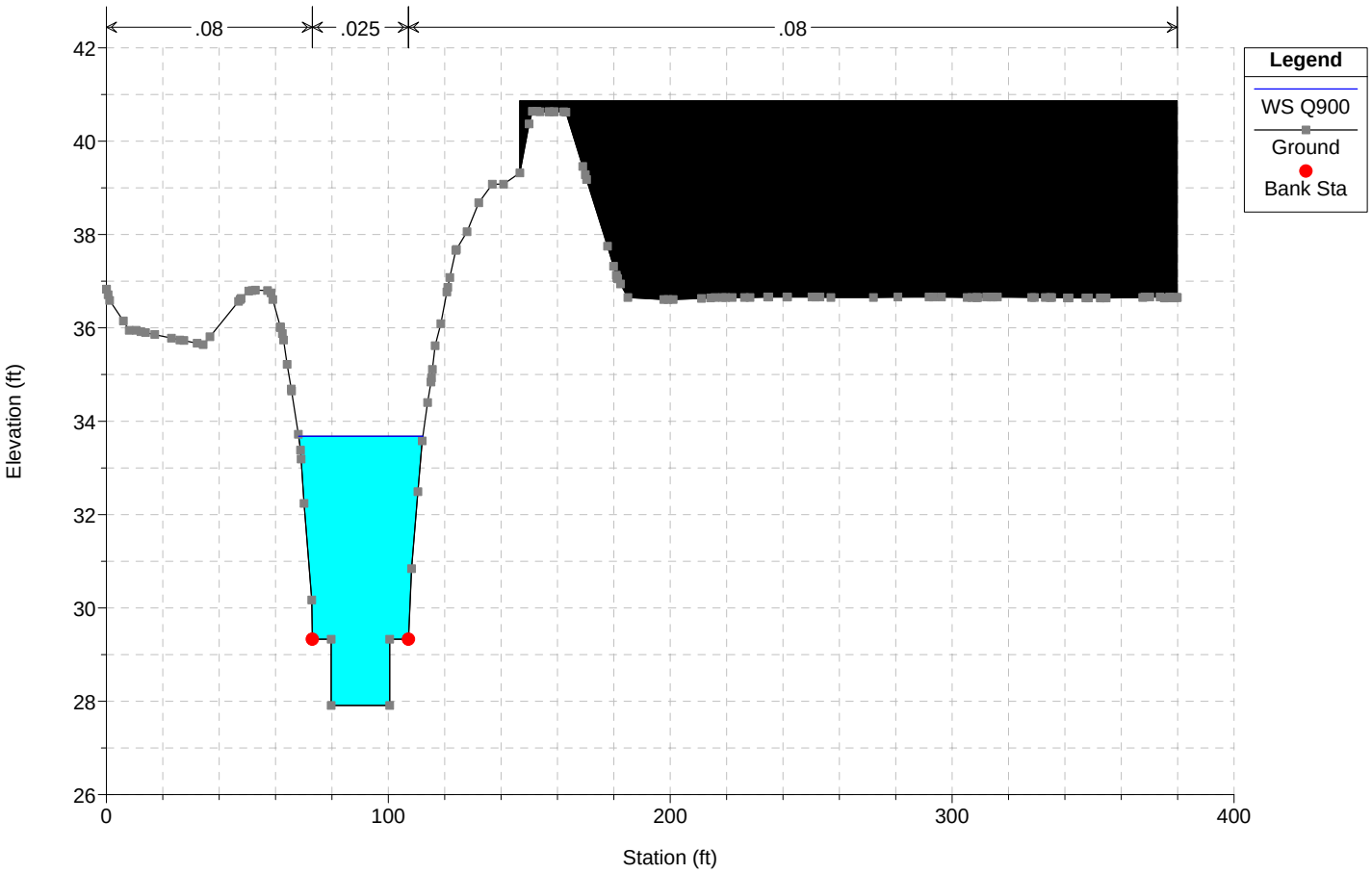

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 4011.72
.08
.025
.08
Legend
WS Q900
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 3962.20*
.08
.025
.08
Legend
WS Q900
Ground
Bank Sta
Elevation (ft)
Station (ft)

Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

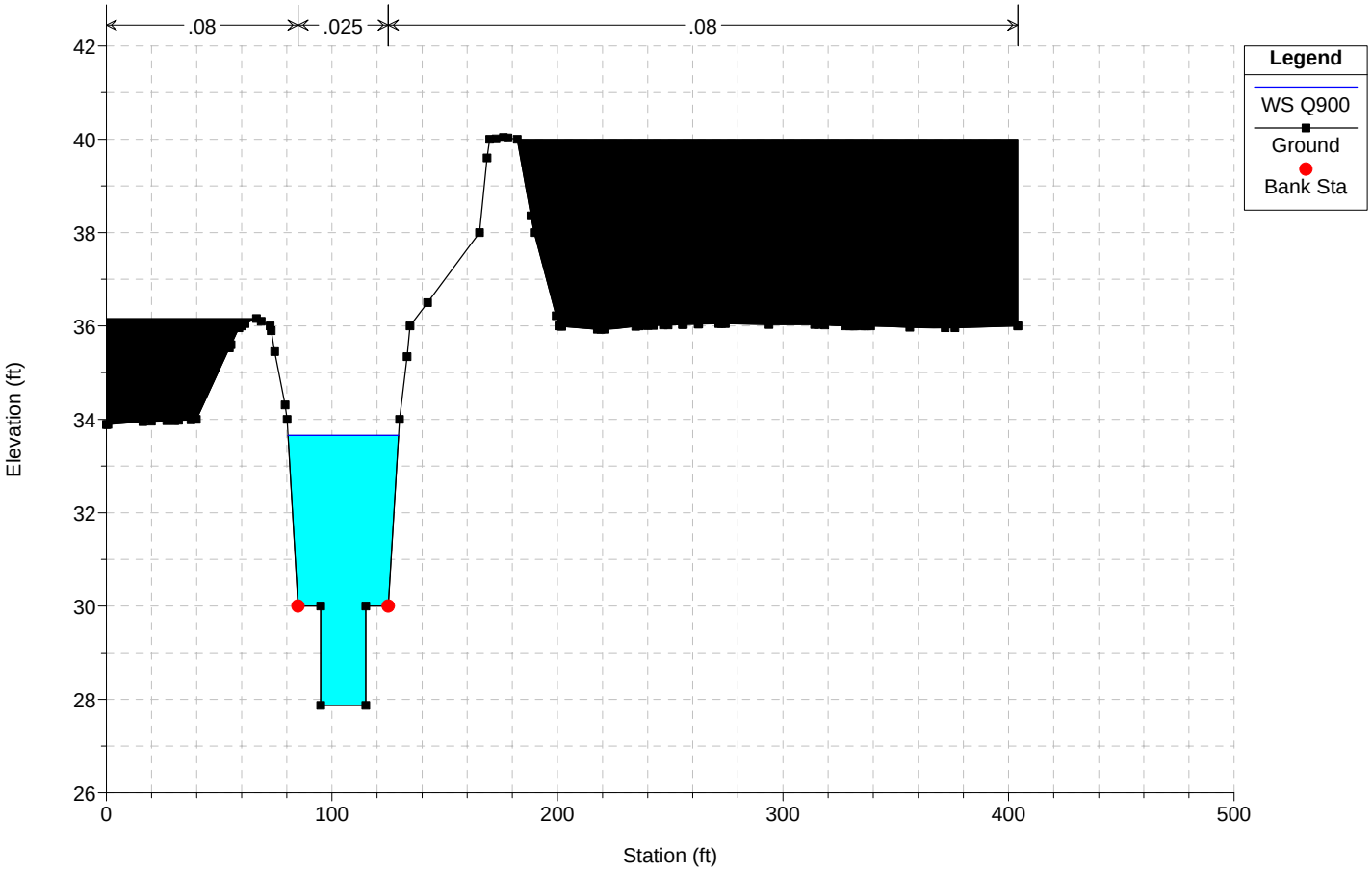
River = SG CHANNEL Reach = SG CHANNEL RS = 3912.68*



Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

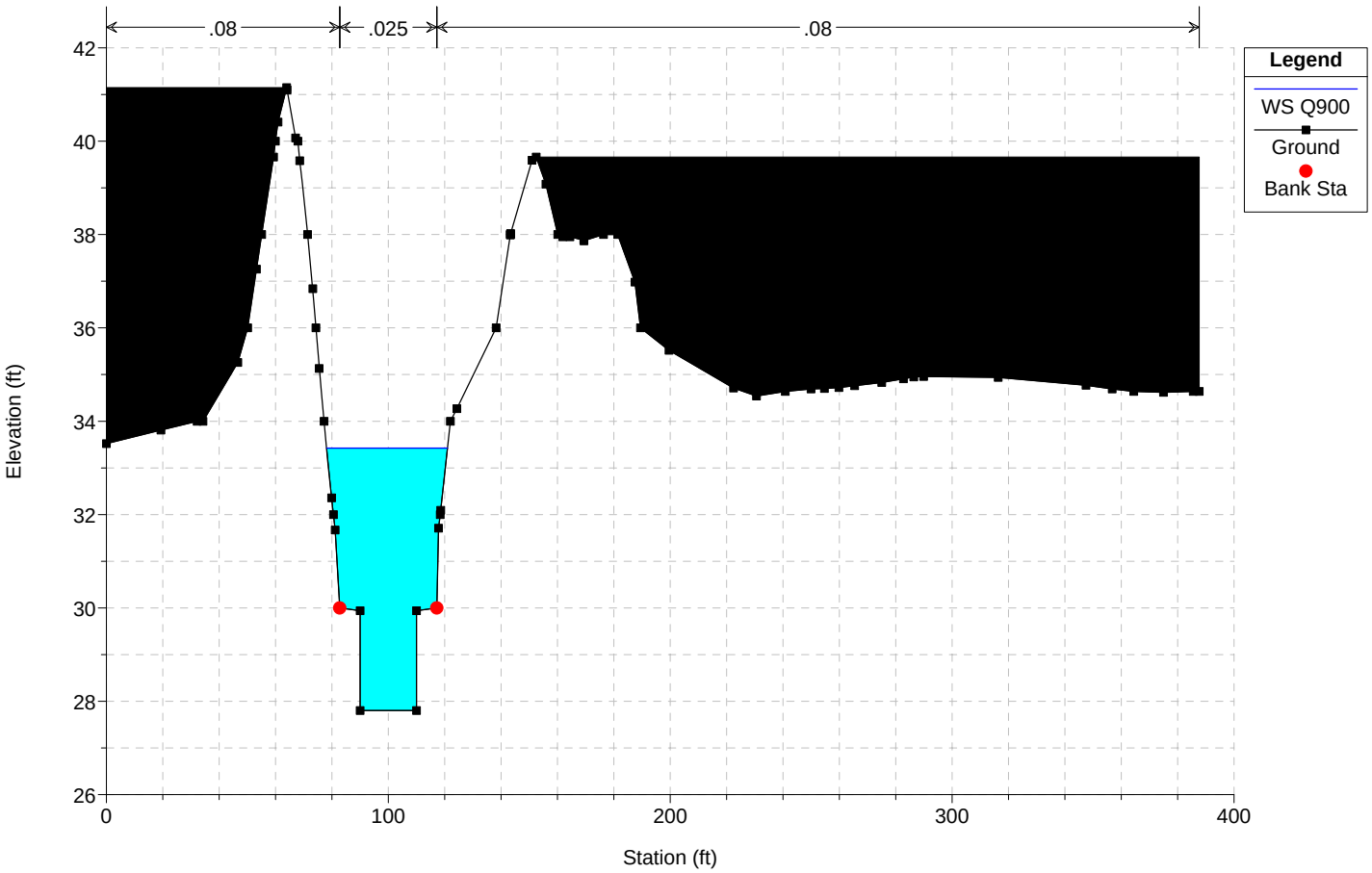
River = SG CHANNEL Reach = SG CHANNEL RS = 3863.17



Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

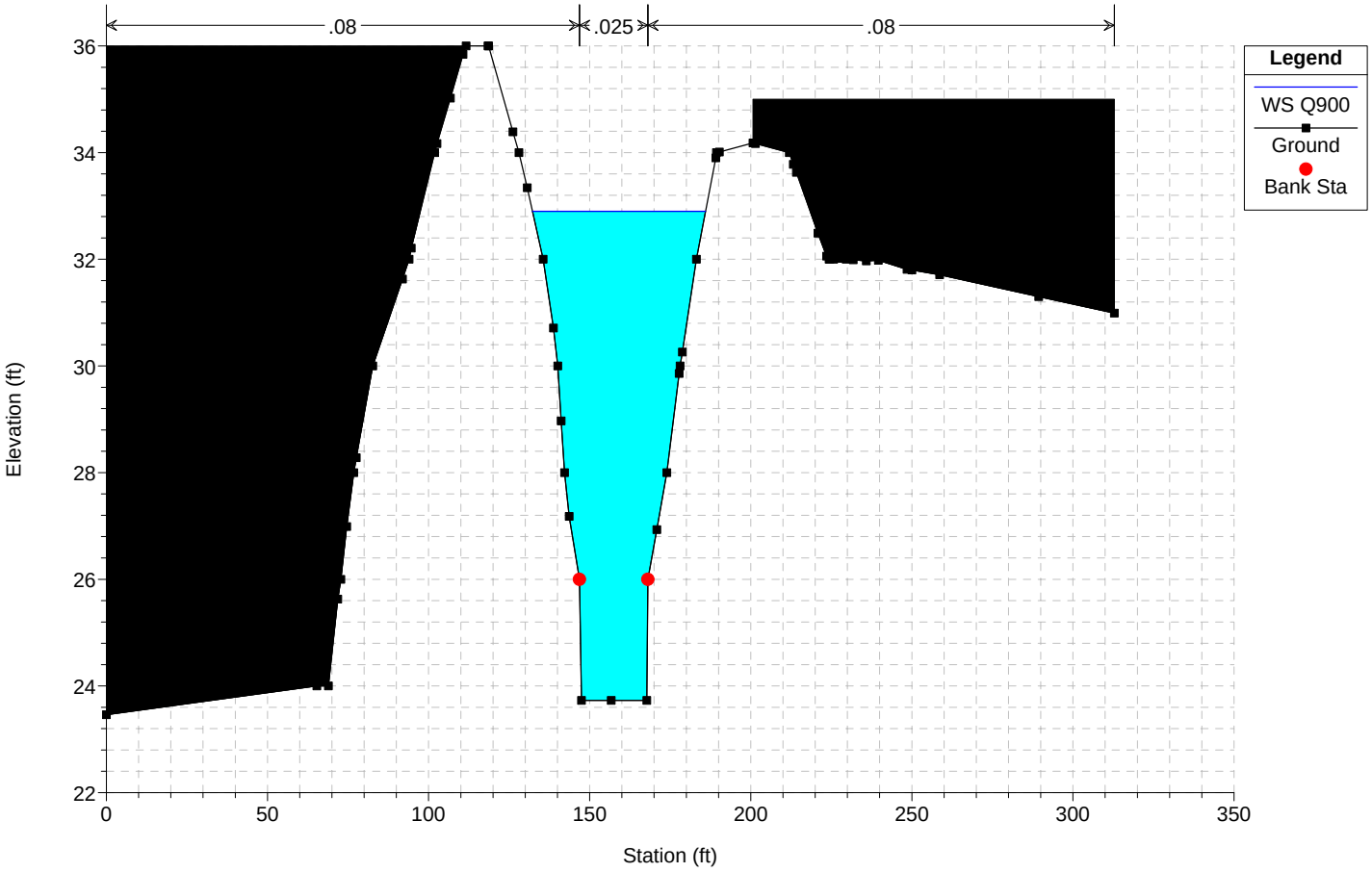
River = SG CHANNEL Reach = SG CHANNEL RS = 3774.45



Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

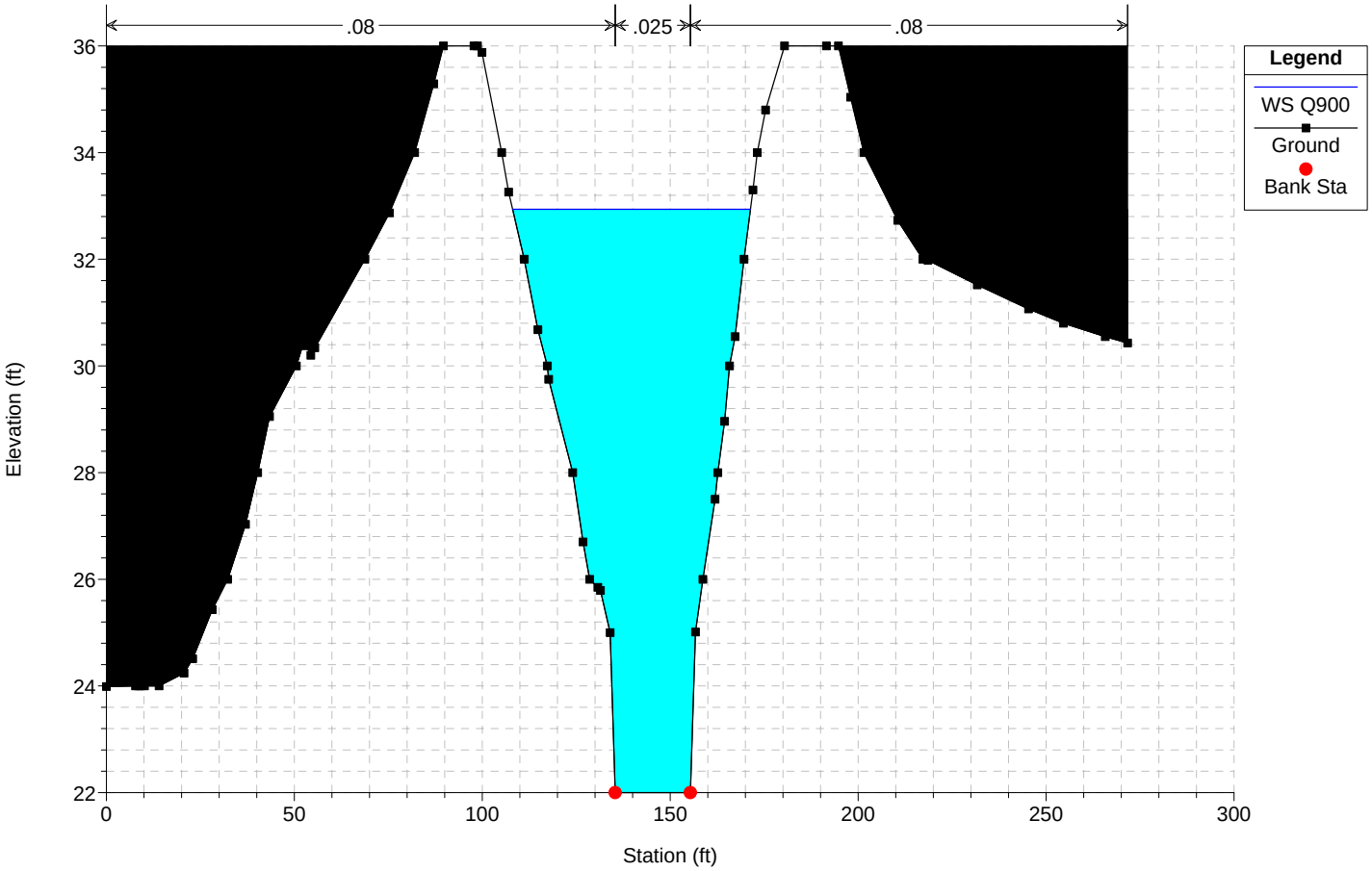
River = SG CHANNEL Reach = SG CHANNEL RS = 2623.27



Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

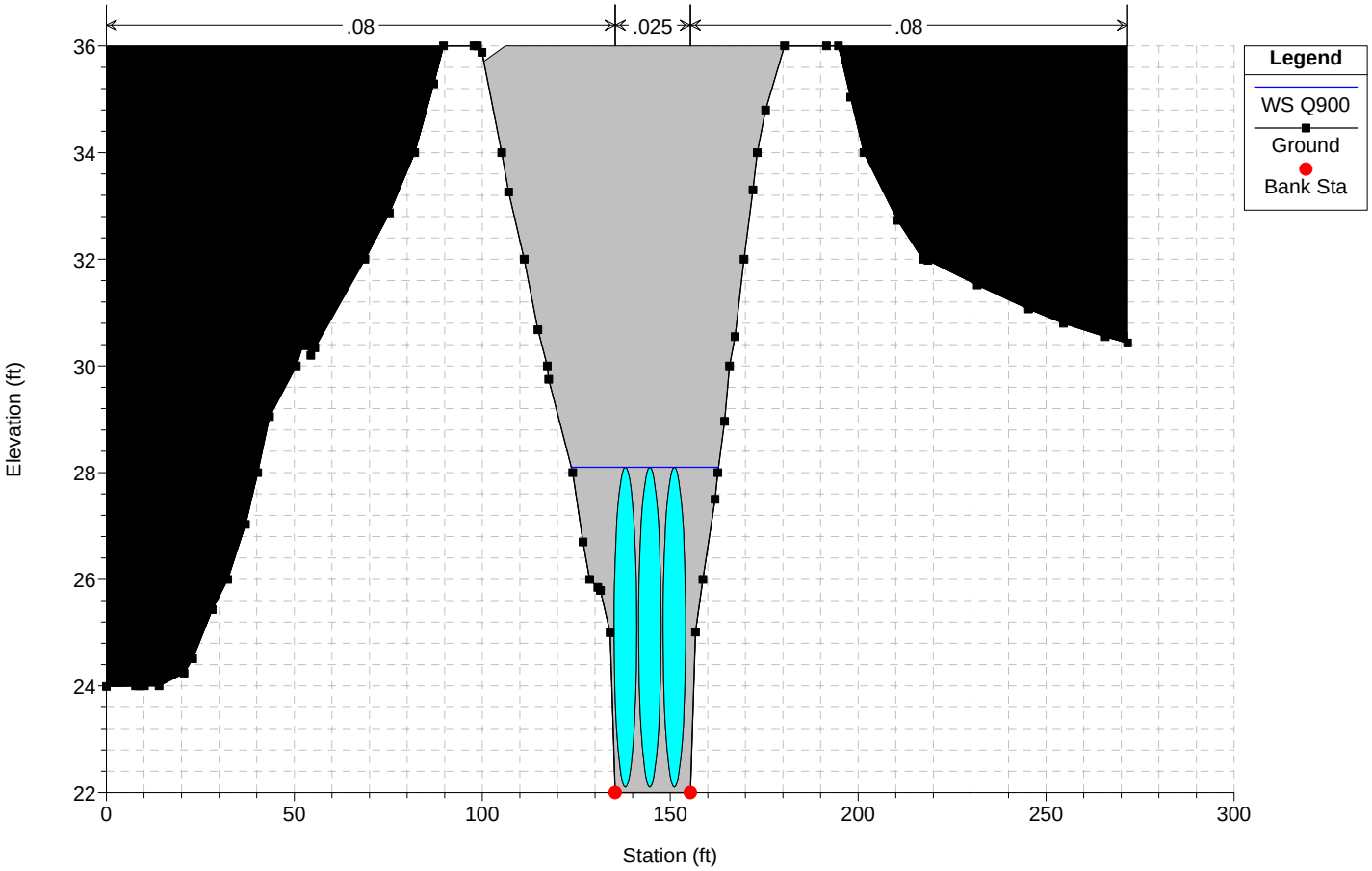
River = SG CHANNEL Reach = SG CHANNEL RS = 2549.85



Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

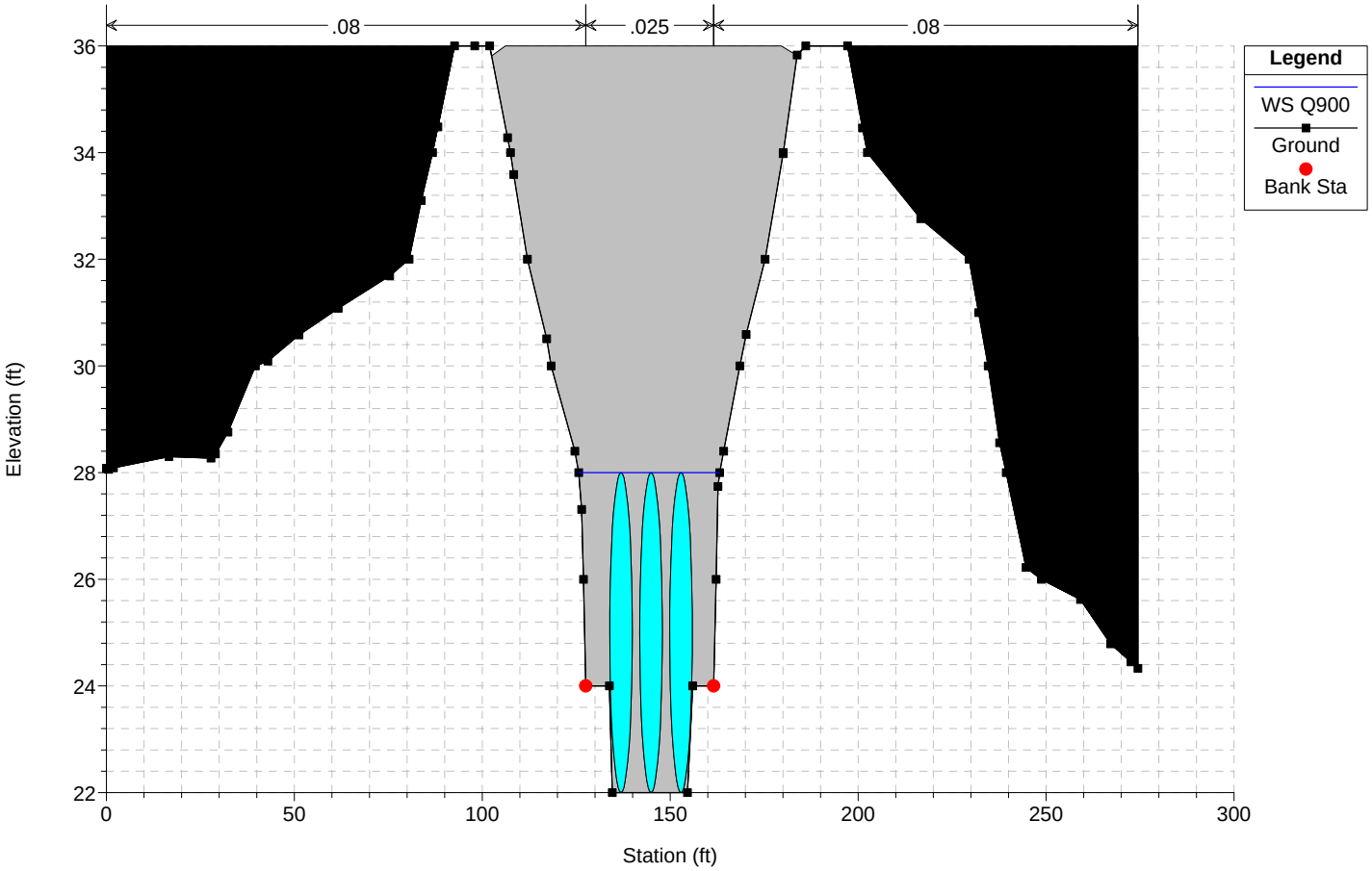
River = SG CHANNEL Reach = SG CHANNEL RS = 2500 Culv DISNEY CROSSING TRIPLE 72-INCH CMPs



Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

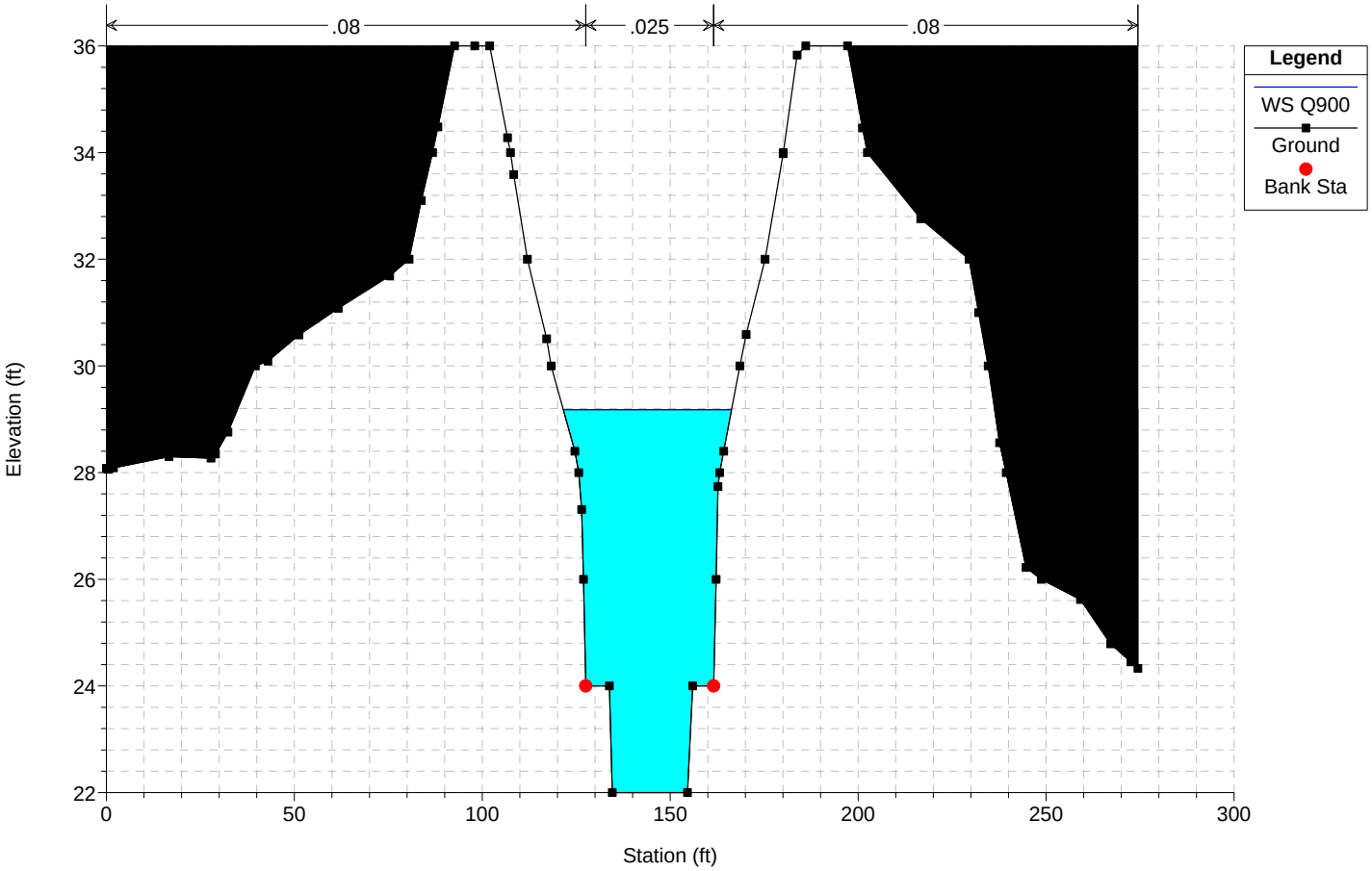
River = SG CHANNEL Reach = SG CHANNEL RS = 2500 Culv DISNEY CROSSING TRIPLE 72-INCH CMPs

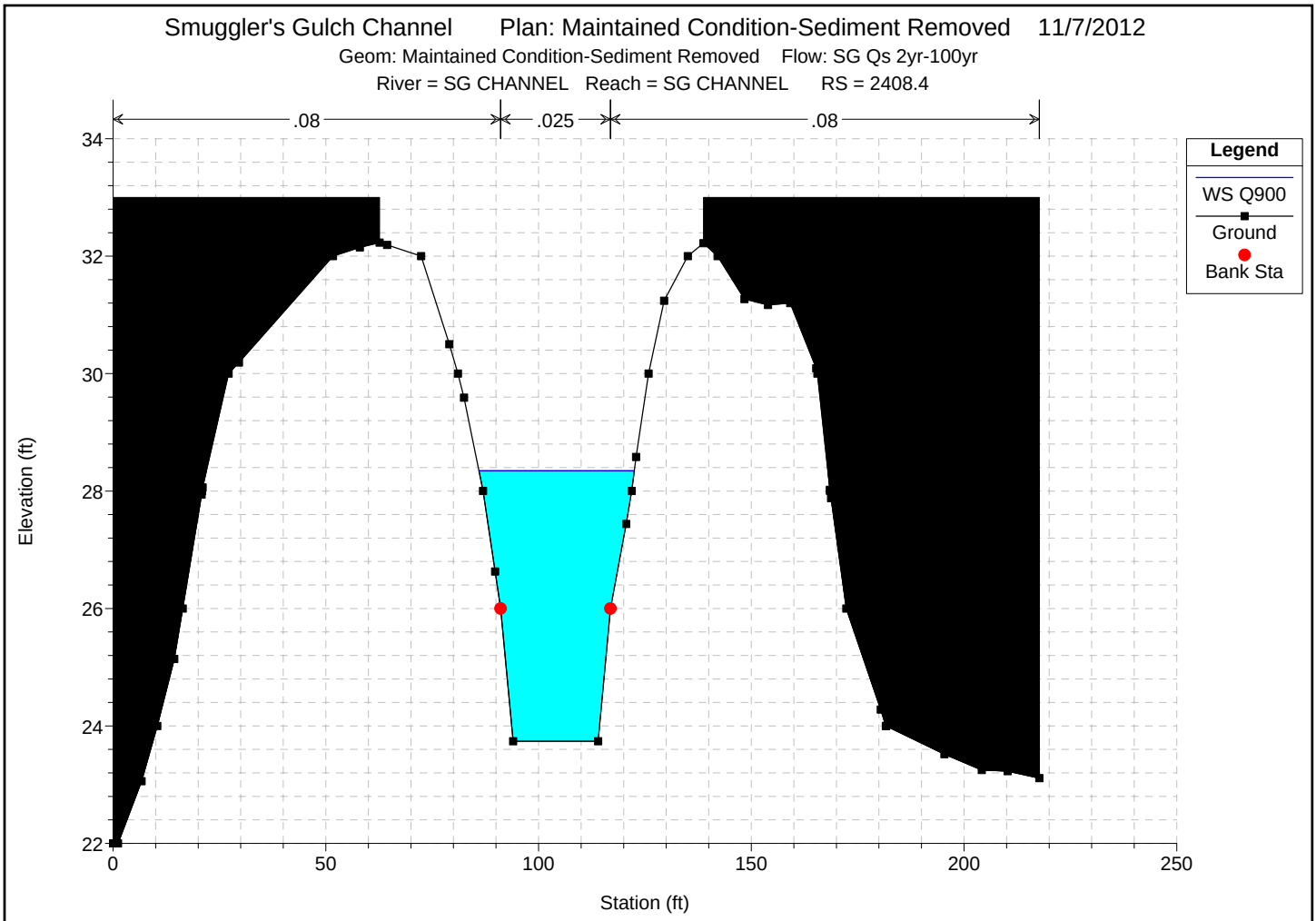


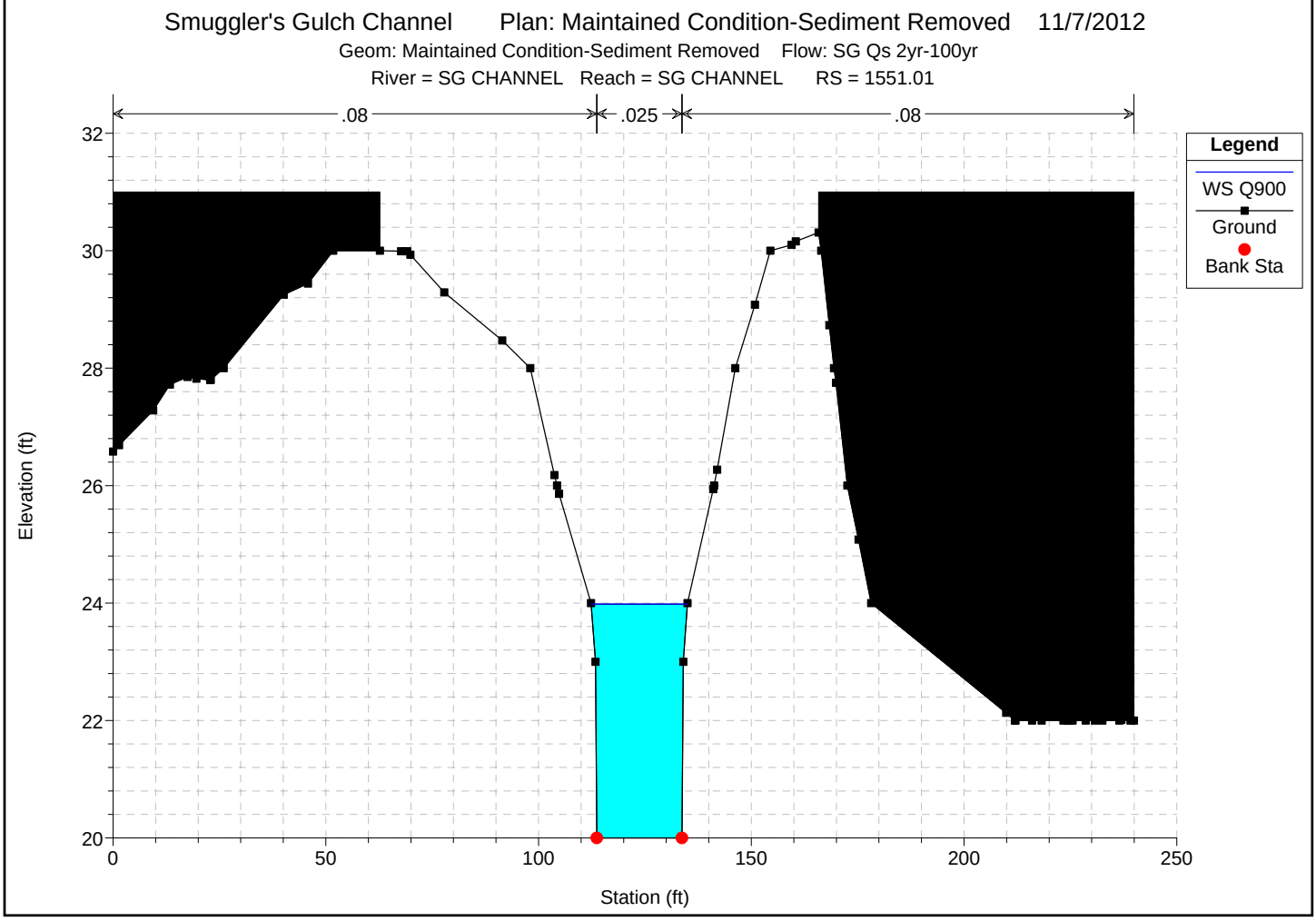
Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012

Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr

River = SG CHANNEL Reach = SG CHANNEL RS = 2489.75




Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 2408.4
.08
.025
.08
Legend
WS Q900
Ground
Bank Sta
Elevation (ft)
Station (ft)
34
32
30
28
26
24
22
0
50
100
150
200
250


Smuggler's Gulch Channel Plan: Maintained Condition-Sediment Removed 11/7/2012
Geom: Maintained Condition-Sediment Removed Flow: SG Qs 2yr-100yr
River = SG CHANNEL Reach = SG CHANNEL RS = 1551.01
.08
.025
.08
Legend
WS Q900
Ground
Bank Sta
Elevation (ft)
Station (ft)
32
30
28
26
24
22
20
0
50
100
150
200
250

Attachment 5
Rick Engineering Site Photos taken on April 21, 2015

SITE PHOTOS:

Date of Site Visit: April 21, 2015

See Photo Location Map for picture locations and orientation.

1.

Smuggler's Gulch Channel roughly 200 feet upstream of the Monument Road crossing.

2.

Monument Road crossing of Smuggler's Gulch Channel. Facing upstream, showing sand deposition at road level.

3.

Downstream of the 52-inch CMP beneath the Monument Road crossing of Smuggler's Gulch.

4.

Just downstream of the Monument Road crossing, showing a downstream view of Smuggler's Gulch.

SITE PHOTOS:

Date of Site Visit: April 21, 2015

See Photo Location Map for picture locations and orientation.

5.	6.
	
Smuggler's Gulch channel roughly 100 feet downstream of the Monument Road crossing showing cobbles and gravel beneath the sand deposition.	Smuggler's Gulch channel roughly 200 feet downstream of the Monument Road crossing showing sand deposition covering the channel streambed with minimal cobbles.

7.	8.
	
Upstream side of the Disney crossing of Smugglers Gulch showing sediment deposition.	Smuggler's Gulch channel, roughly 200 feet downstream of the Disney crossing facing upstream.

SITE PHOTOS:

Date of Site Visit: April 21, 2015

See Photo Location Map for picture locations and orientation.

9.

Smuggler's Gulch channel, roughly 200 feet downstream of the Disney crossing facing downstream.

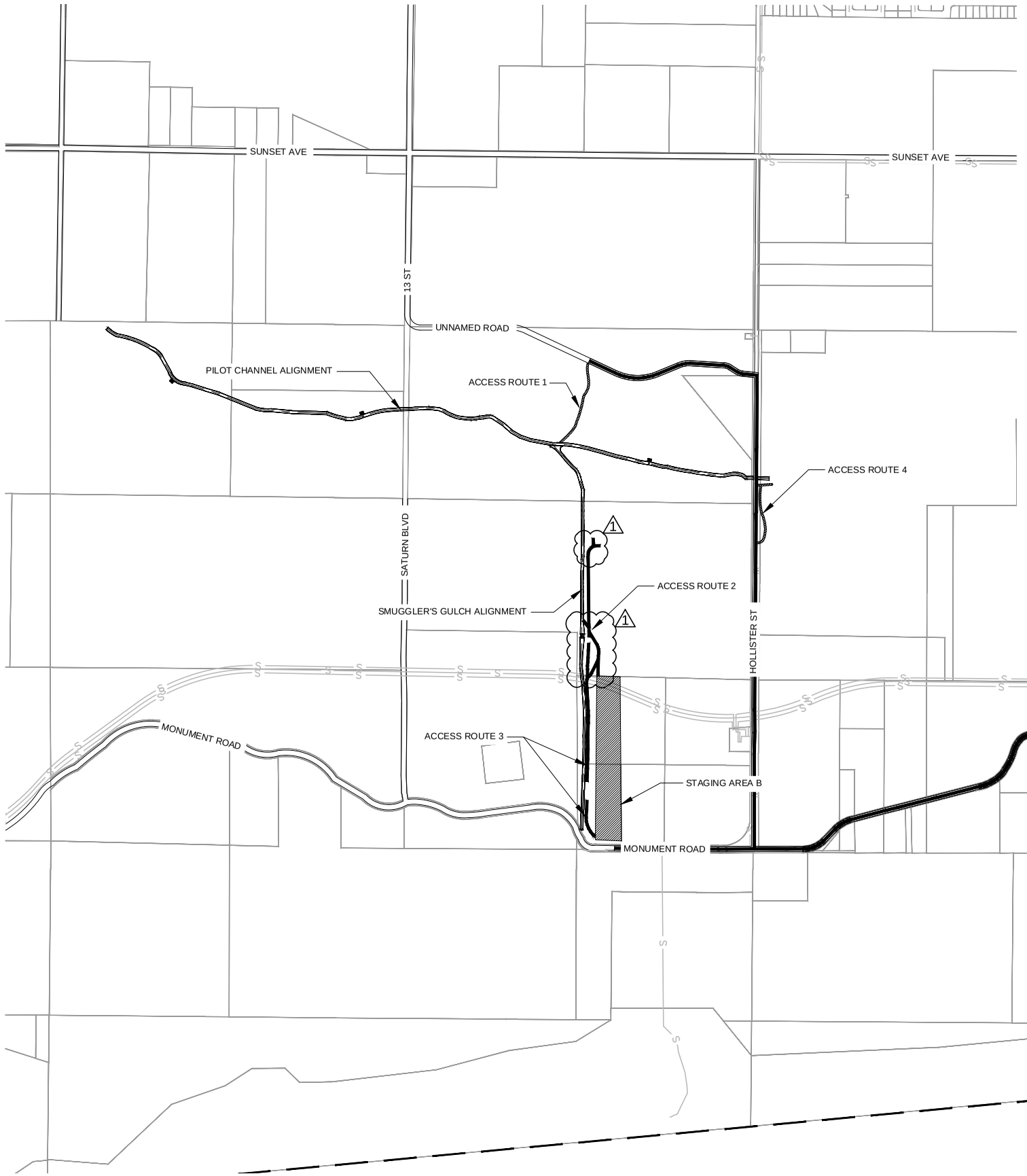
10.

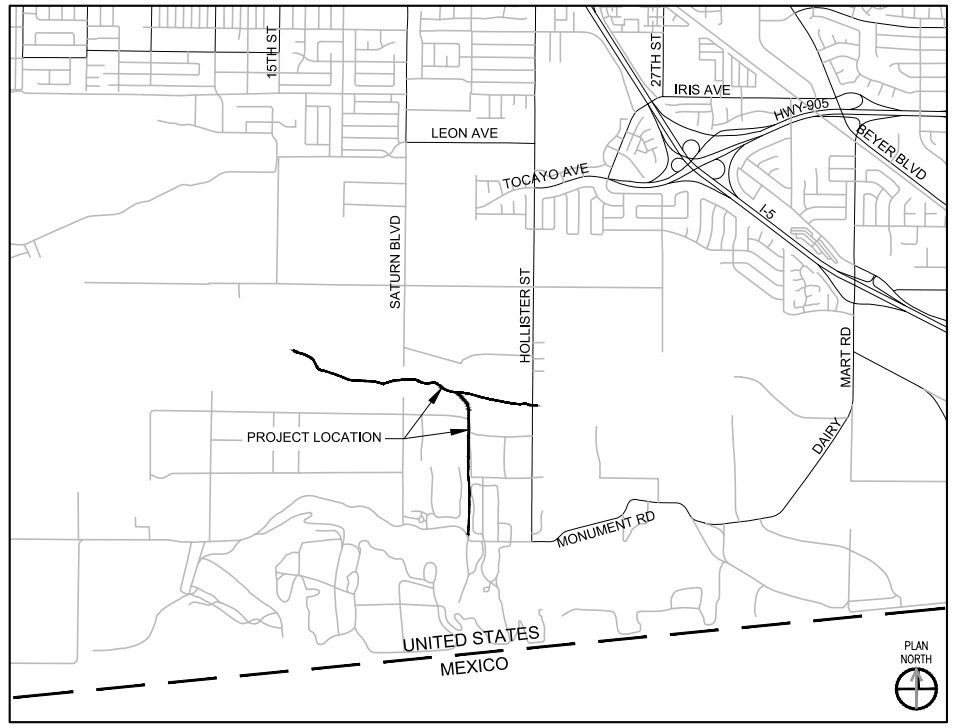
Vegetation in the Tijuana River Pilot channel shown from the Hollister Street Bridge crossing.

11.

An overview of the Tijuana River Southern Channel and Pilot Channel from a nearby vantage point.

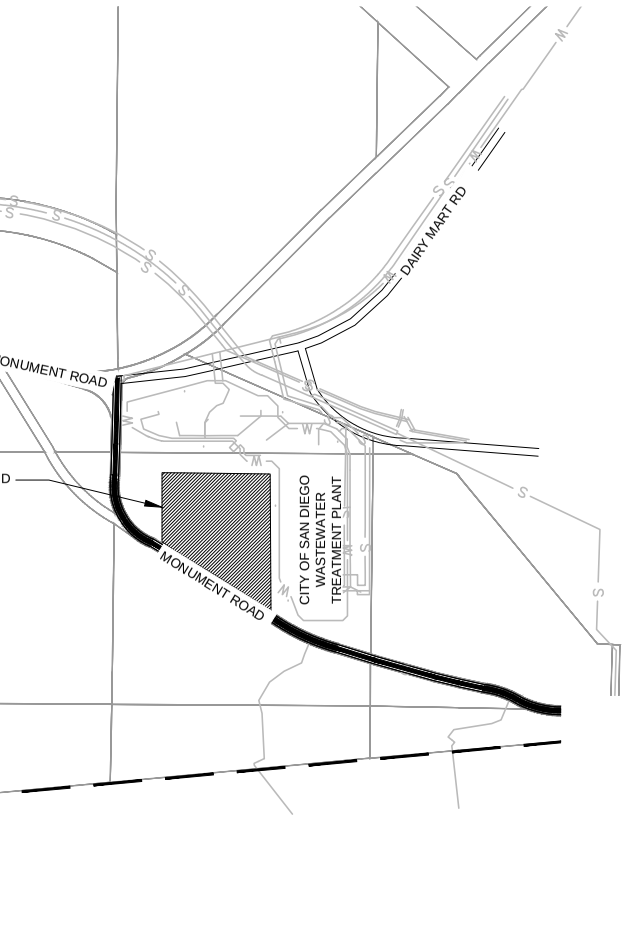
Attachment 6
As-built of 2013 Maintenance





VICINITY MAP

NOT TO SCALE



LEGEND

- PERMANENT TURNAROUND AREA (30' x 25')
- EXISTING ACCESS ROAD
- ESA
- STABALIZED CONSTRUCTION ENTRANCE (TC-1)
- W — EX WATER MAIN
- SD — EX STORM DRAIN
- S — EX SEWER MAIN
- SF — SILT FENCE (SE-1)
- FR — FIBER ROLL (SE-5)
- STAGING AREA LIMITS
- MAJOR CONTOUR
- MINOR CONTOUR
- PARCEL
- HAUL ROUTE

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE STANDARD SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF SAN DIEGO.

- MAINTENANCE OF CHANNELS TO REMOVE ACCUMULATED SEDIMENT AND OTHER DEBRIS

STANDARD SPECIFICATIONS

STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), 2012 EDITION, DOCUMENT NO. PITS070112-01

CITY OF SAN DIEGO STANDARD SPECIFICATIONS FOR PUBLICWORKS CONSTRUCTION (WHITEBOOK), 2012 EDITION, DOCUMENT NO. PITS070112-02

CALIFORNIA DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, 2012 EDITION, DOCUMENT NO. PITS070112-04

CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S. CUSTOMARY STANDARD SPECIFICATIONS, 2010 EDITION, DOCUMENT NO. PITS070112-02

STANDARD DRAWINGS

CITY OF SAN DIEGO STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, 2012 EDITION, DOCUMENT NO. PIT070112-03

CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S. CUSTOMARY STANDARD PLANS, 2010 EDITION, DOCUMENT NO. PITS070112-05

PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS. (FROM CYCLE 4)

DATUM: NAD 1983 STATEPLANE CALIFORNIA VI FIPS 0406 FEET
TOPO ELEVATIONS FOR PICTORIAL PURPOSES ONLY
TOPOGRAPHY DATE: 1999

WORK PERFORMED 9/2013 - 3/2014

INTERIM AS-BUILT PLANS FOR THE CONSTRUCTION OF

TIJUANA RIVER VALLEY

OVERALL PLAN

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 1 OF 15 SHEETS

W.O. NO._____

1 REVISED MAINTENANCE ACCESS

MATCHLINE - SEE SHEET 3

AS-BUILT DRAWING PILOT CHANNEL ALIGNMENT

AS-BUILT TURNAROUND PER PROJECT BIOLOGIST

AS-BUILT DRAWING SMUGGLERS GULCH CHANNEL ALIGNMENT

VEGETATION REMOVAL AND EXCAVATION OF SEDIMENT

VEGETATION REMOVAL AND EXCAVATION OF SEDIMENT

VEGETATION REMOVAL AND EXCAVATION OF SEDIMENT

VEGETATION REMOVAL ONLY

VEGETATION REMOVAL ONLY

STA 4+00 - EAST SIDE BEGIN VEGETATION REMOVAL

STA 5+25 - EAST SIDE BEGIN EXCAVATION REMOVAL

AUTHORIZED MAINTENANCE AREA - NO WORK CONDUCTED DURING 2013-14 MAINTENANCE PERIOD, SUBJECT TO FUTURE MAINTENANCE

STABILIZED CONSTRUCTION ENTRANCE WITH SHAKER PLATES (20'W x 50'L)

LEGEND

- PERMANENT TURNAROUND AREA (30' x 25')
- EXISTING ACCESS ROAD
- HAUL ROUTES
- ESA
- STABALIZED CONSTRUCTION ENTRANCE (TC-1)
- W — EX WATER MAIN
- SD — EX STORM DRAIN
- S — EX SEWER MAIN
- SF — SILT FENCE (SE-1)
- FR — FIBER ROLL (SE-5)
- STAGING AREA LIMITS
- MAJOR CONTOUR
- MINOR CONTOUR
- PARCEL
- MHPA

Pilot Channel			
Number	Radius	Length	Line/Chord Direction
L1		155.34	N87° 38' 04.19"W
C1	80.00	36.90	N74° 25' 10.64"W
C2	120.00	80.99	N80° 32' 22.55"W
L3		35.90	S80° 07' 32.00"W
C3	350.00	114.66	S89° 30' 37.75"W
L4		251.35	N81° 06' 16.50"W
C4	300.00	16.56	N79° 31' 22.00"W
L5		79.77	N77° 56' 27.51"W
C5	250.00	16.49	N79° 49' 52.01"W
L6		41.10	N81° 43' 16.51"W
C6	300.00	22.18	N79° 36' 11.39"W
L7		311.42	N77° 29' 06.28"W
C7	300.00	18.26	N75° 44' 30.24"W
L8		191.63	N73° 59' 54.21"W
C8	1000.00	276.32	N81° 54' 51.53"W
L9		20.02	N89° 49' 48.84"W
C9	100.00	18.10	N84° 38' 40.78"W

PLAN NORTH

60' 0' 30' 60' 120' 180'

GRAPHIC SCALE
1 INCH = 60 FT

NOTES:

1. ENTIRE CHANNEL MAINTENANCE AREA SUBJECT TO IN-CHANNEL ENHANCEMENT MITIGATION REQUIREMENTS.
2. SEE SHEET 8 FOR CHANNEL SECTION.

LEGEND

PLAN ALIGNMENT

- CHANNEL MAINTENANCE CENTERLINE
- LIMITS OF CHANNEL MAINTENANCE

AS-BUILT ALIGNMENT

- VEGETATION REMOVAL AND EXCAVATION OF SEDIMENT
- VEGETATION REMOVAL ONLY
- AUTHORIZED MAINTENANCE AREA

WORK PERFORMED 9/2013 - 3/2014

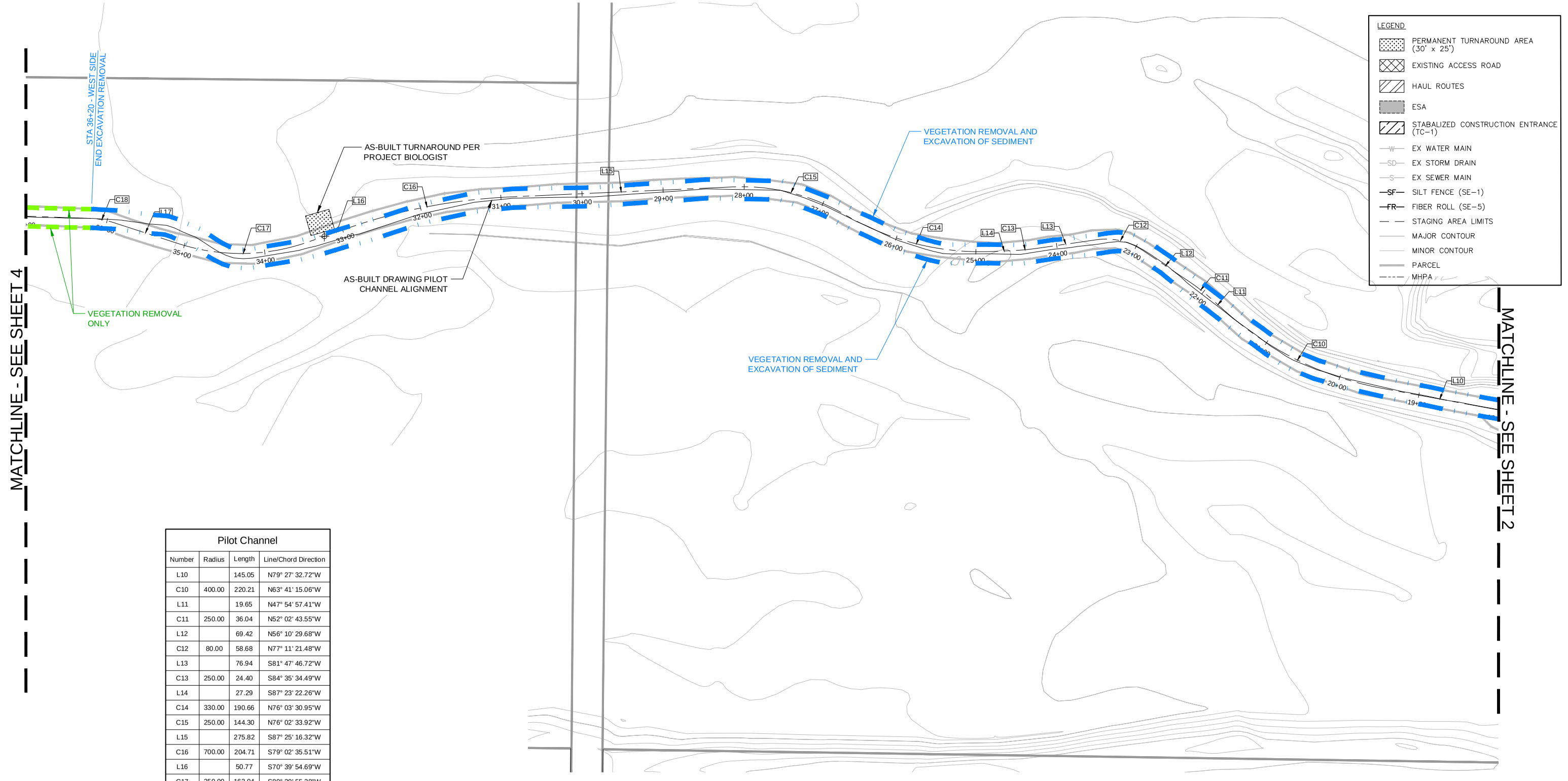
INTERIM AS-BUILT PLANS FOR THE CONSTRUCTION OF

TIJUANA RIVER VALLEY

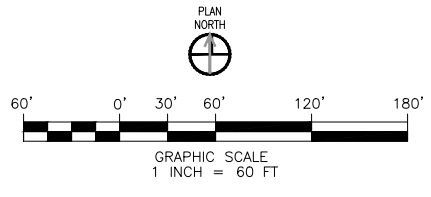
PILOT CHANNEL MAINTENANCE

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 2 OF 15 SHEETS

W.O. NO.



Pilot Channel			
Number	Radius	Length	Line/Chord Direction
L10		145.05	N79° 27' 32.72"W
C10	400.00	220.21	N63° 41' 15.06"W
L11		19.65	N47° 54' 57.41"W
C11	250.00	36.04	N52° 02' 43.55"W
L12		69.42	N56° 10' 29.68"W
C12	80.00	58.68	N77° 11' 21.48"W
L13		76.94	S81° 47' 46.72"W
C13	250.00	24.40	S84° 35' 34.49"W
L14		27.29	S87° 23' 22.26"W
C14	330.00	190.66	N76° 03' 30.95"W
C15	250.00	144.30	N76° 02' 33.92"W
L15		275.82	S87° 25' 16.32"W
C16	700.00	204.71	S79° 02' 35.51"W
L16		50.77	S70° 39' 54.69"W
C17	250.00	163.04	S89° 20' 55.38"W
L17		84.46	N71° 58' 03.93"W
C18	100.00	28.07	N80° 00' 35.71"W



NOTES:

1. ENTIRE CHANNEL MAINTENANCE AREA SUBJECT TO IN-CHANNEL ENHANCEMENT MITIGATION REQUIREMENTS.
2. SEE SHEET 8 FOR CHANNEL SECTION.

LEGEND

PLAN ALIGNMENT		AS-BUILT ALIGNMENT	
	CHANNEL MAINTENANCE CENTERLINE		VEGETATION REMOVAL AND EXCAVATION OF SEDIMENT
	LIMITS OF CHANNEL MAINTENANCE		VEGETATION REMOVAL ONLY

WORK PERFORMED 9/2013 - 3/2014

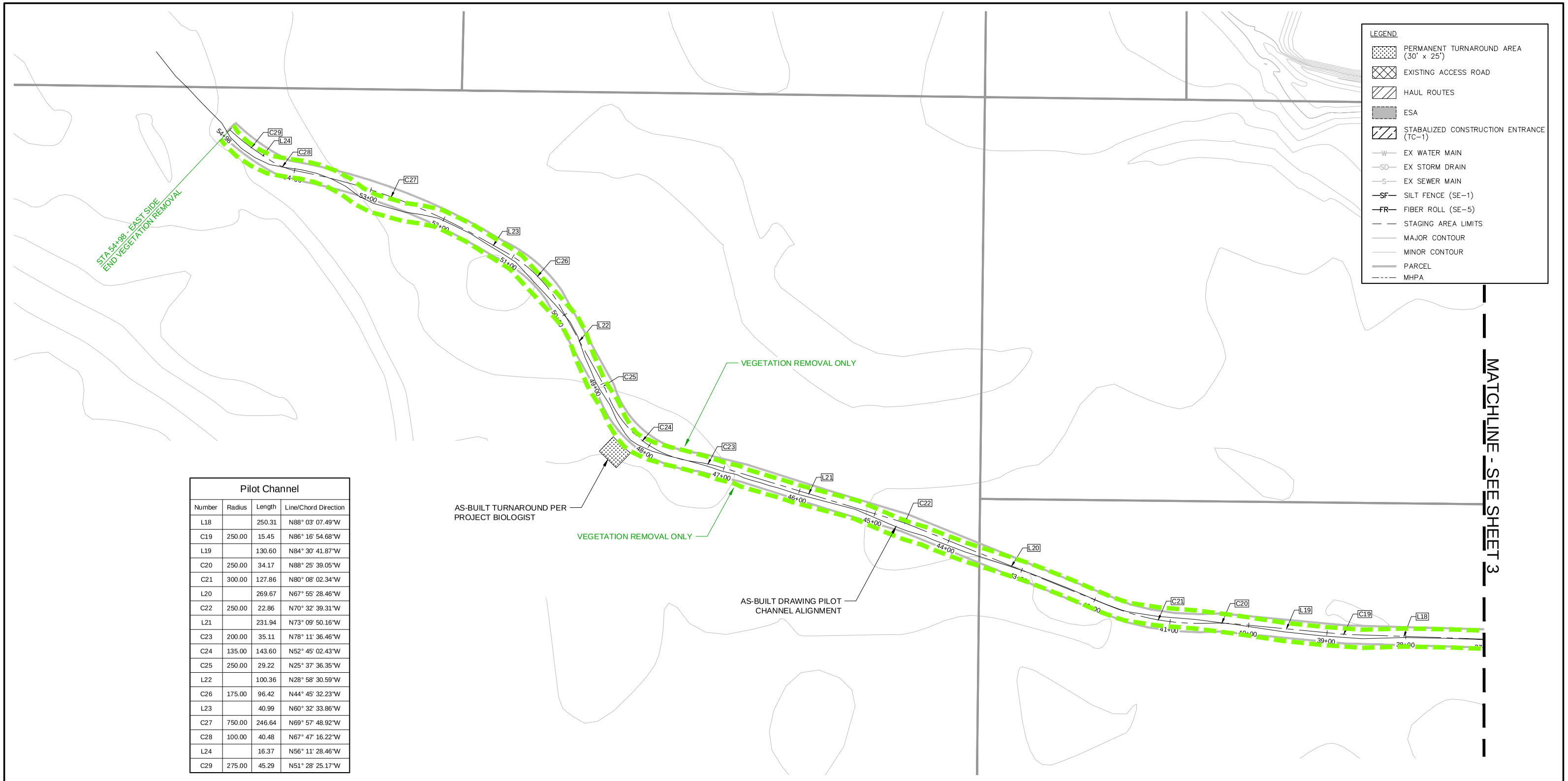
INTERIM AS-BUILT PLANS FOR THE CONSTRUCTION OF

TIJUANA RIVER VALLEY

PILOT CHANNEL MAINTENANCE

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 3 OF 15 SHEETS

W.O. NO.



Pilot Channel			
Number	Radius	Length	Line/Chord Direction
L18		250.31	N88° 03' 07.49"W
C19	250.00	15.45	N86° 16' 54.68"W
L19		130.60	N84° 30' 41.87"W
C20	250.00	34.17	N88° 25' 39.05"W
C21	300.00	127.86	N80° 08' 02.34"W
L20		269.67	N67° 55' 28.46"W
C22	250.00	22.86	N70° 32' 39.31"W
L21		231.94	N73° 09' 50.16"W
C23	200.00	35.11	N78° 11' 36.46"W
C24	135.00	143.60	N52° 45' 02.43"W
C25	250.00	29.22	N25° 37' 36.35"W
L22		100.36	N28° 58' 30.59"W
C26	175.00	96.42	N44° 45' 32.23"W
L23		40.99	N60° 32' 33.86"W
C27	750.00	246.64	N69° 57' 48.92"W
C28	100.00	40.48	N67° 47' 16.22"W
L24		16.37	N56° 11' 28.46"W
C29	275.00	45.29	N51° 28' 25.17"W

NOTES:

1. ENTIRE CHANNEL MAINTENANCE AREA SUBJECT TO IN-CHANNEL ENHANCEMENT MITIGATION REQUIREMENTS.
2. SEE SHEET 8 FOR CHANNEL SECTION.

PLAN NORTH

60' 0' 30' 60' 120' 180'

GRAPHIC SCALE
1 INCH = 60 FT

LEGEND

PLAN ALIGNMENT		AS-BUILT ALIGNMENT	
——— – ———	CHANNEL MAINTENANCE CENTERLINE	- - - - -	VEGETATION REMOVAL ONLY
———	LIMITS OF CHANNEL MAINTENANCE		

WORK PERFORMED 9/2013 - 3/2014

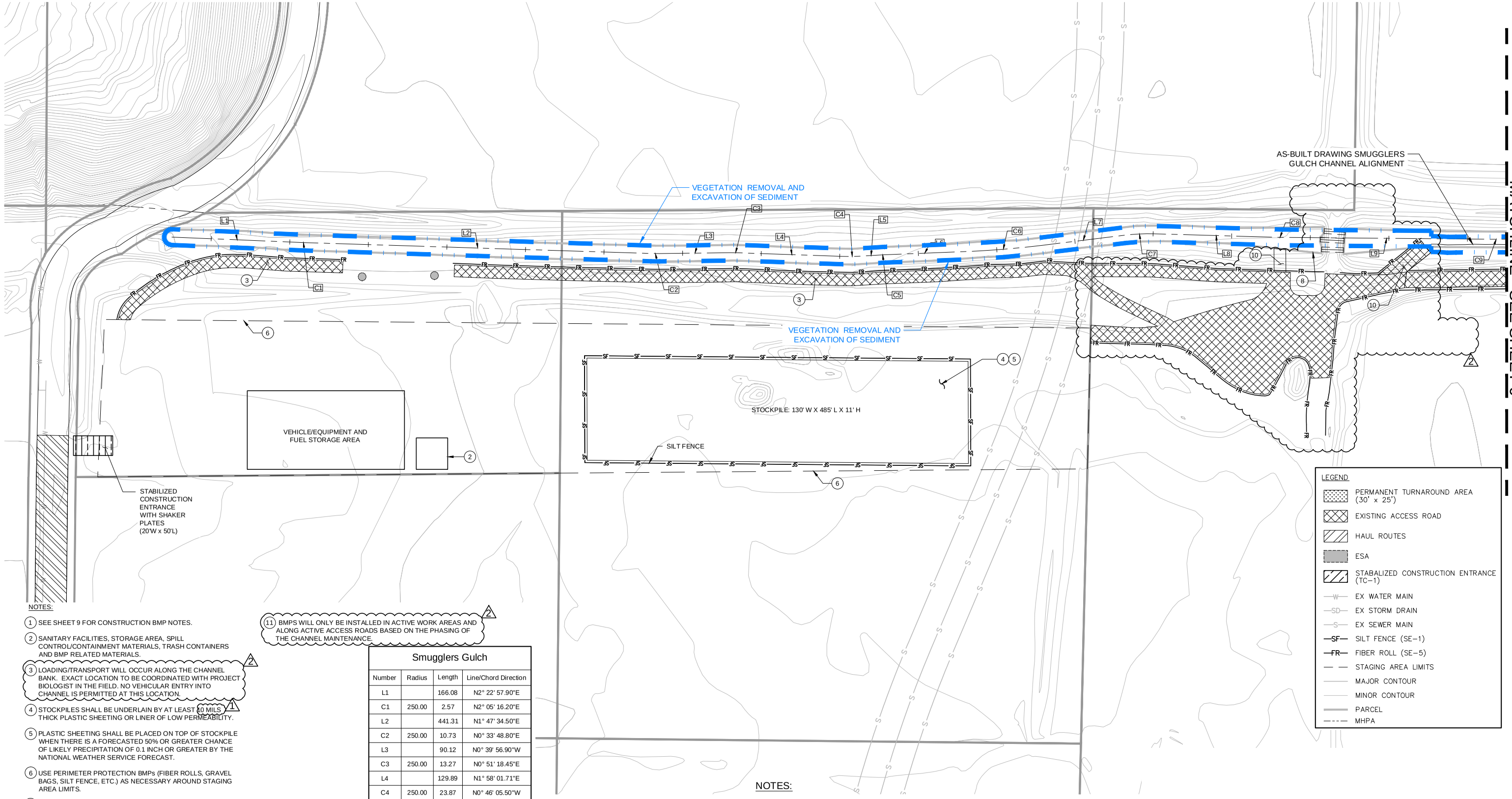
INTERIM AS-BUILT
PLANS FOR THE CONSTRUCTION OF

TIJUANA RIVER VALLEY

PILOT CHANNEL MAINTENANCE

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 4 OF 15 SHEETS

W.O. NO.



NOTES:

1. SEE SHEET 9 FOR CONSTRUCTION BMP NOTES.
2. SANITARY FACILITIES, STORAGE AREA, SPILL CONTROL/CONTAINMENT MATERIALS, TRASH CONTAINERS AND BMP RELATED MATERIALS.
3. LOADING/TRANSPORT WILL OCCUR ALONG THE CHANNEL BANK. EXACT LOCATION TO BE COORDINATED WITH PROJECT BIOLOGIST IN THE FIELD. NO VEHICULAR ENTRY INTO CHANNEL IS PERMITTED AT THIS LOCATION. 2
4. STOCKPILES SHALL BE UNDERLAIN BY AT LEAST 10 MILS THICK PLASTIC SHEETING OR LINER OF LOW PERMEABILITY. 1
5. PLASTIC SHEETING SHALL BE PLACED ON TOP OF STOCKPILE WHEN THERE IS A FORECASTED 50% OR GREATER CHANCE OF LIKELY PRECIPITATION OF 0.1 INCH OR GREATER BY THE NATIONAL WEATHER SERVICE FORECAST.
6. USE PERIMETER PROTECTION BMPs (FIBER ROLLS, GRAVEL BAGS, SILT FENCE, ETC.) AS NECESSARY AROUND STAGING AREA LIMITS.
7. SEE SHEET 8 FOR CHANNEL SECTION.
8. DEBRIS COLLECTED ON SLOPE AREAS DIRECTLY UPSTREAM OF DISNEY CROSSING SHALL BE REMOVED. NO CHANGES TO SLOPE GRADING SHALL BE MADE. 2
9. CHANNEL WIDTH ±33' TO ALLOW CLEANING OF THE EXISTING CULVERTS.
10. ACCESS POINT TO CHANNEL (15' WIDTH) FOR EQUIPMENT. EXACT LOCATION TO BE COORDINATED WITH PROJECT BIOLOGIST IN THE FIELD.
11. BMPS WILL ONLY BE INSTALLED IN ACTIVE WORK AREAS AND ALONG ACTIVE ACCESS ROADS BASED ON THE PHASING OF THE CHANNEL MAINTENANCE. 2

PLAN NORTH

60' 0' 30' 60' 120' 180'

GRAPHIC SCALE
1 INCH = 60 FT

Smugglers Gulch

Number	Radius	Length	Line/Chord Direction
L1		166.08	N2° 22' 57.90"E
C1	250.00	2.57	N2° 05' 16.20"E
L2		441.31	N1° 47' 34.50"E
C2	250.00	10.73	N0° 33' 48.80"E
L3		90.12	N0° 39' 56.90"W
C3	250.00	13.27	N0° 51' 18.45"E
L4		129.89	N1° 58' 01.71"E
C4	250.00	23.87	N0° 46' 05.50"W
L5		24.21	N3° 30' 12.71"W
C5	250.00	5.41	N2° 53' 02.92"W
L6		101.46	N2° 15' 53.12"W
C6	1200.00	98.72	N4° 37' 17.06"W
L7		106.26	N6° 58' 41.01"W
C7	250.00	37.51	N2° 40' 48.37"W
L8		157.77	N1° 37' 04.27"E
C8	250.00	4.86	N1° 03' 39.50"E
L9		266.50	N0° 30' 14.72"E
C9	1000.00	12.15	N0° 09' 21.78"E

NOTES:

1. ENTIRE CHANNEL MAINTENANCE AREA SUBJECT TO IN-CHANNEL ENHANCEMENT MITIGATION REQUIREMENTS.
2. SEE SHEET 8 FOR CHANNEL SECTION.

LEGEND

PLAN ALIGNMENT

CHANNEL MAINTENANCE CENTERLINE

LIMITS OF CHANNEL MAINTENANCE

AS-BUILT ALIGNMENT

VEGETATION REMOVAL AND EXCAVATION OF SEDIMENT

WORK PERFORMED 9/2013 - 3/2014

INTERIM AS-BUILT PLANS FOR THE CONSTRUCTION OF

TIJUANA RIVER VALLEY

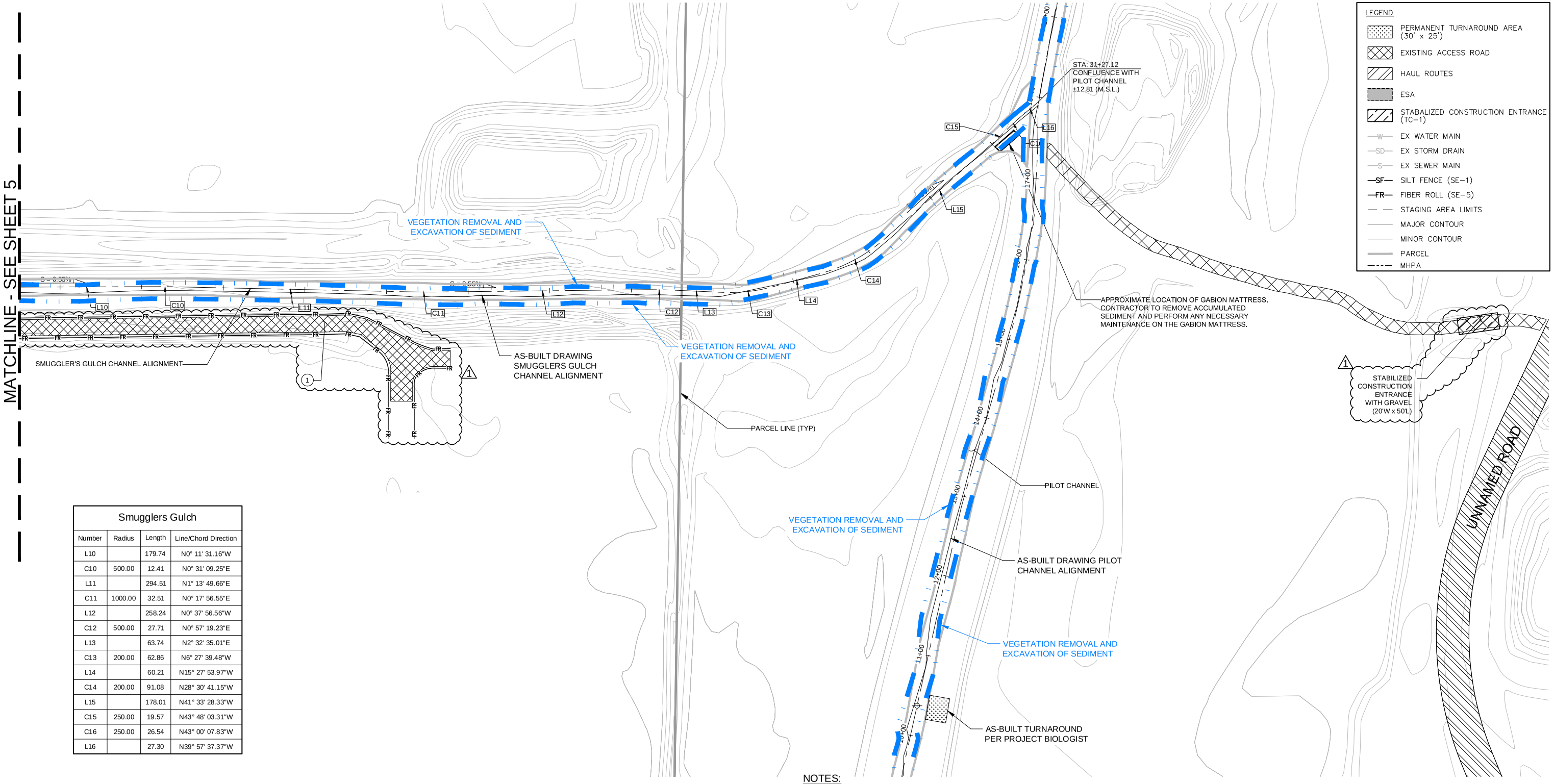
SMUGGLERS GULCH MAINTENANCE

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 5 OF 15 SHEETS

W.O. NO._____

1 REVISED PLASTIC SHEETING 2 REVISED MAINTENANCE ACCESS

MATCHLINE - SEE SHEET 5



Smugglers Gulch			
Number	Radius	Length	Line/Chord Direction
L10		179.74	N0° 11' 31.16"W
C10	500.00	12.41	N0° 31' 09.25"E
L11		294.51	N1° 13' 49.66"E
C11	1000.00	32.51	N0° 17' 56.55"E
L12		258.24	N0° 37' 56.56"W
C12	500.00	27.71	N0° 57' 19.23"E
L13		63.74	N2° 32' 35.01"E
C13	200.00	62.86	N6° 27' 39.48"W
L14		60.21	N15° 27' 53.97"W
C14	200.00	91.08	N28° 30' 41.15"W
L15		178.01	N41° 33' 28.33"W
C15	250.00	19.57	N43° 48' 03.31"W
C16	250.00	26.54	N43° 00' 07.83"W
L16		27.30	N39° 57' 37.37"W

NOTES:

1. ENTIRE CHANNEL MAINTENANCE AREA SUBJECT TO IN-CHANNEL ENHANCEMENT MITIGATION REQUIREMENTS.
2. SEE SHEET 8 FOR CHANNEL SECTION.

PLAN NORTH

60' 0' 30' 60' 120' 180'

GRAPHIC SCALE
1 INCH = 60 FT

NOTES:

1. LOADING/TRANSPORT WILL OCCUR ALONG THE CHANNEL BANK. EXACT LOCATION TO BE COORDINATED WITH PROJECT BIOLOGIST IN THE FIELD. NO VEHICULAR ENTRY INTO CHANNEL IS PERMITTED AT THIS LOCATION. (1)
2. SEE SHEET 8 FOR CHANNEL SECTION.
3. BMPS WILL ONLY BE INSTALLED IN ACTIVE WORK AREAS AND ALONG ACTIVE ACCESS ROADS BASED ON THE PHASING OF THE CHANNEL MAINTENANCE. (1)

LEGEND

PLAN ALIGNMENT

CHANNEL MAINTENANCE CENTERLINE

LIMITS OF CHANNEL MAINTENANCE

AS-BUILT ALIGNMENT

VEGETATION REMOVAL AND EXCAVATION OF SEDIMENT

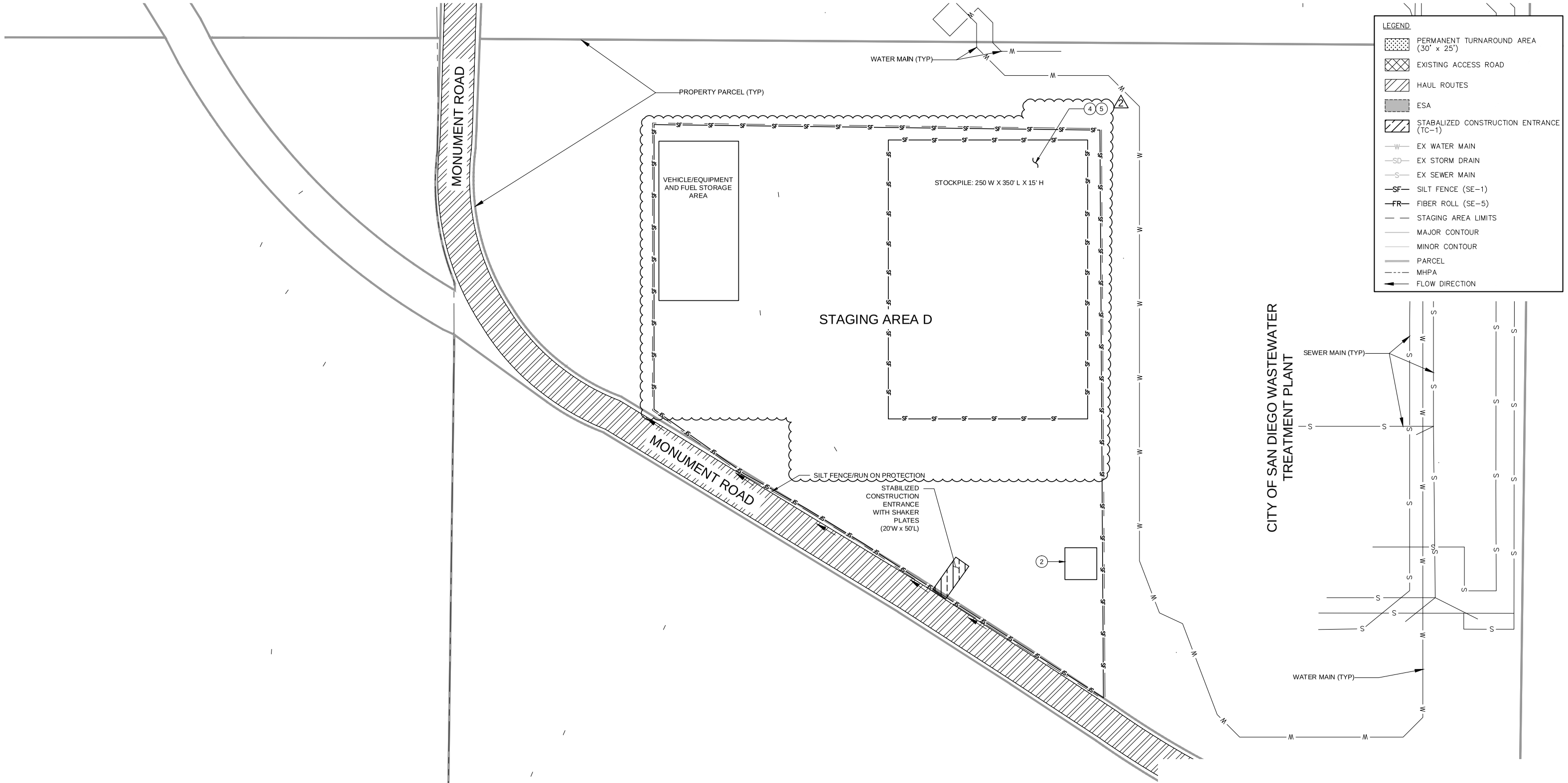
WORK PERFORMED 9/2013 - 3/2014

INTERIM AS-BUILT PLANS FOR THE CONSTRUCTION OF TIJUANA RIVER VALLEY SMUGGLERS GULCH MAINTENANCE

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 6 OF 15 SHEETS

W.O. NO.

1 REVISED MAINTENANCE ACCESS



PLAN NORTH

60' 0' 30' 60' 120' 180'

GRAPHIC SCALE
1 INCH = 60 FT

NOTES:

1. SEE SHEET 9 FOR CONSTRUCTION BMP NOTES.
2. SANITARY FACILITIES STORAGE AREA, SPILL CONTROL/CONTAINMENT MATERIALS, TRASH CONTAINERS AND BMP RELATED MATERIALS.
3. STAGING AREA D TO BE USED FOR PROCESSING EXCAVATED MATERIALS.
4. STOCKPILES SHALL BE UNDERLAIN BY AT LEAST 10 MILS (1) THICK PLASTIC SHEETING OR LINER OF LOW PERMEABILITY.
5. PLASTIC SHEETING SHALL BE PLACED ON TOP OF STOCKPILE WHEN THERE IS A FORECASTED 50% OR GREATER CHANCE OF LIKELY PRECIPITATION OF 0.1 INCH OR GREATER BY THE NATIONAL WEATHER SERVICE FORECAST.

WORK PERFORMED 9/2013 - 3/2014

INTERIM AS-BUILT PLANS FOR THE CONSTRUCTION OF

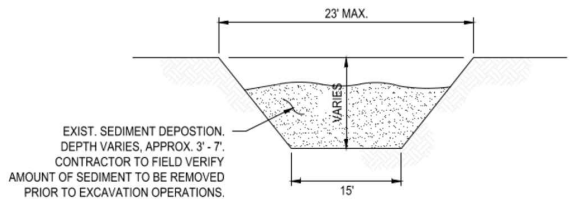
TIJUANA RIVER VALLEY

STAGING AREA D

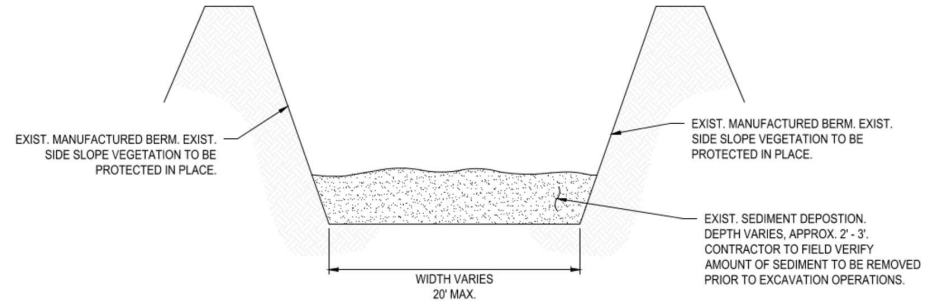
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 7 OF 15 SHEETS

W.O. NO. _____

1 REVISED PLASTIC SHEETING
2 REVISED STOCKPILE LOCATION



TIJUANA RIVER PILOT CHANNEL SECTION (TYPICAL)
NOT TO SCALE



SMUGGLER'S GULCH CHANNEL SECTION (TYPICAL)
NOT TO SCALE

WORK PERFORMED 9/2013 - 3/2014

INTERIM AS–BUILT
PLANS FOR THE CONSTRUCTION OF

TIJUANA RIVER VALLEY

CROSS SECTIONS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 8 OF 15 SHEETS

W.O.
NO.

CONSTRUCTION BMP NOTES:

1. ALL BEST MANAGEMENT PRACTICES (BMPs) WILL BE IMPLEMENTED PRIOR TO OR CONCURRENT WITH CONSTRUCTION AND MAINTAINED THROUGHOUT THE PROJECT. A QUALIFIED CONTACT PERSON WILL BE RESPONSIBLE FOR IMPLEMENTING THE WATER POLLUTION CONTROL PLAN (WPCP.) ALL WORK SHALL BE COMPLETED BETWEEN SEPTEMBER 15TH AND FEBRUARY 15TH UNLESS AN EXTENSION IS GRANTED IN CONFORMANCE WITH ALL APPLICABLE PERMITS.
2. CONTRACTOR WILL LIMIT ALL CONSTRUCTION RELATED ACTIVITIES TO THE PROJECT FOOTPRINT.
3. EXISTING VEGETATION TO BE PRESERVED IN PLACE SHALL BE CLEARLY MARKED WITH A BUFFER AREA FOLLOWING THE GUIDANCE OF BMP FACT SHEET EC-2.
4. REMOVAL OF VEGETATION MUST OCCUR BY HAND, MECHANICALLY, OR USING U.S. ENVIRONMENTAL PROTECTION AGENCY APPROVED HERBICIDES DEPLOYED WITH APPLICABLE BMPs TO PREVENT IMPACTS TO BENEFICIAL USES OF WATERS OF THE U.S. AND/OR STATE. USE OF AQUATIC PESTICIDES MUST BE DONE IN ACCORDANCE WITH STATE WATER RESOURCES CONTROL BOARD WATER QUALITY ORDER NO. 2004-0009-DWQ, AND ANY SUBSEQUENT REISSUANCE AS APPLICABLE. REMOVAL OF VEGETATION MUST OCCUR OUTSIDE OF THE AVIAN NESTING SEASON (MARCH 15-AUGUST 31).
5. REMOVAL AND DISPOSAL OF EXOTIC INVASIVE SPECIES SHALL BE DONE IN A MANNER THAT PREVENTS THE SPREAD OF EXOTIC INVASIVE SPECIES TO OTHER AREAS.
6. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ADEQUATE WIND EROSION CONTROL IS AVAILABLE ONSITE FOLLOWING BMP FACT SHEET WE-1.
7. STABILIZED CONSTRUCTION ROADWAYS AND ENTRANCE/EXITS WILL BE INSTALLED TO PREVENT TRACKING FOLLOWING THE GUIDANCE OF BMP FACT SHEET TC-1 AND TC-2.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP OF SILT AND MUD ON STREETS DUE TO EXCAVATION AND STOCKPILING ACTIVITIES. STREET SWEEPING AND VACUUMING WILL BE MANAGED FOLLOWING THE GUIDANCE OF BMP FACT SHEET SE-7.
9. THE PERIMETER OF THE SITES SHALL BE PROTECTED AGAINST RUN-ON AND RUNOFF USING LINEAR SEDIMENT BARRIERS SUCH AS DRAINAGE SWALES, SILT FENCE, FIBER ROLLS, AND/OR GRAVEL BAG BERMS. THE SEDIMENT CONTROL BMPs MAY BE USED INTERCHANGEABLY BASED ON SITE CONDITIONS AND STORMWATER CONCENTRATION.
10. CONTRACTOR TO PLACE LINEAR SEDIMENT BARRIERS AROUND WORK ZONE FOLLOWING THE GUIDANCE OF BMP FACT SHEETS SC-1, SC-5, SC-6 AND/OR SC-8. SC-1 OR SC-5 SHALL BE USED WHERE APPROPRIATE IN CONJUNCTION WITH CONSTRUCTION FENCE, WHICH WILL BE USED AS SUPPORT. FIBER ROLLS MUST BE ADEQUATELY SECURED SO THAT STORMWATER CANNOT GET AROUND OR UNDER THEM.
11. GRAVEL BAG BERMS MAY BE USED TO FORM BARRIERS ACROSS SLOPES TO INTERCEPT RUNOFF AND RELEASE IT AS SHEET FLOW, PROVIDING SOME SEDIMENT REMOVAL. GRAVEL BAGS CAN BE USED WHERE FLOWS ARE MODERATELY CONCENTRATED, SUCH AS IN DITCHES AND SWALES. GRAVEL BAGS SHALL BE USED AS A LINEAR SEDIMENT BARRIER IF FLOW EXCEEDS THE ABILITY OF FIBER ROLLS TO CONTROL. GRAVEL BAG BERMS WILL BE IMPLEMENTED FOLLOWING THE GUIDANCE OF BMP FACT SHEET SE-6.
12. FIBER ROLLS SHALL ALSO BE USED IN VEGETATED AREAS, ON SLOPES, AND TO FORM BERMS AROUND STOCKPILES. FIBER ROLLS SHALL BE IMPLEMENTED FOLLOWING THE GUIDANCE OF BMP FACT SHEET SC-5. SILT FENCE MAY ALSO BE USED AT TOES OF STOCKPILES.
13. WEATHER TRIGGERED ACTION PLAN SHALL BE IMPLEMENTED WHEN THERE IS A FORECASTED 50% OR GREATER CHANCE OF LIKELY PRECIPITATION OF 0.1 INCH OR GREATER BY THE NATIONAL WEATHER SERVICE FORECAST.
14. SOIL ROUGHENING CAN BE USED IN CONJUNCTION WITH HYDRAULICALLY APPLIED STABILIZATION METHODS, GEOTEXTILES, FIBER ROLLS, OR MULCH TO PROTECT, TEMPORARY STOCKPILES, OR SWALES FOLLOWING THE GUIDANCE OF BMP FACT SHEETS EC-4, EC-5, & EC-7.
15. CONTRACTOR SHALL RESTORE ALL EROSION CONTROL DEVICES TO WORKING ORDER AFTER EACH RUNOFF-PRODUCING RAINFALL.
16. TEMPORARY EROSION OR SEDIMENT CONTROL MEASURES WILL BE REMOVED UPON COMPLETION OF MAINTENANCE UNLESS THEIR REMOVAL WOULD RESULT IN GREATER ENVIRONMENTAL IMPACT THAN LEAVING THEM IN PLACE.
17. WASTE AND STOCKPILES SHALL BE MANAGED FOLLOWING THE GUIDANCE OF BMP FACT SHEETS WM-3, WM-5, WM-6, WM-7, AND WM-10. COMPOSTABLE GREEN WASTE MATERIALS SHALL BE TRANSPORTED TO AN APPROVED COMPOSTING FACILITY WHEN FEASIBLE.
18. EXPOSED WASTE MATERIALS AND SOIL STOCKPILES SHALL BE TEMPORARILY STORED IN STAGING AREAS B AND D UNTIL REMOVAL TO A PERMITTED DISPOSAL FACILITY. EXPOSED WASTE MATERIALS AND SOIL STOCKPILES SHALL BE PROTECTED IN PLACE USING SILT FENCE, FIBER ROLLS, GRAVEL BAGS, PLASTIC COVERS, AND/OR DRAINAGE SWALES FOLLOWING THE GUIDANCE OF BMP FACT SHEETS SE-1, SE-5, SE-6, EC-7 AND/OR EC-9. MANAGEMENT OF STOCKPILES TEMPORARILY MUST ALSO COMPLY WITH R9-2007-0104, CONDITIONAL WAIVERS OF WASTE DISCHARGE REQUIREMENTS FOR SPECIFIC TYPES OF DISCHARGE WITHIN THE SAN DIEGO REGION, CONDITIONAL WAIVER 8.
19. EXCAVATED MATERIALS FROM THE CHANNELS SHALL BE TRANSFERED TO STAGING AREA D TO BE SUFFICIENTLY DRIED AND TO BE PROCESSED TO SEPARATE OUT SEDIMENT, VEGETATION, TRASH AND TIRES.
20. WASTE TIRES SHALL BE SEPARATED FROM EXCAVATED MATERIALS AND TRANSPORTED TO AN APPROPRIATE DISPOSAL FACILITY.. IF MORE THAN NINE TIRES ARE IN A VEHICLE OR WASTE BIN AT ANY ONE TIME, THEY SHALL BE TRANSPORTED UNDER A COMPLETED COMPREHENSIVE TRIP LOG (CTL) TO DOCUMENT THAT THE TIRES WERE TAKEN TO AN APPROPRIATE DISPOSAL FACILITY.
21. EXCAVATED MATERIALS WILL BE REUSED, WHENEVER POSSIBLE, AS FILL MATERIAL, AGGREGATE, SAND REPLENISHMENT OR OTHER RAW MATERIAL USES. RE-USED MATERIAL (AGGREGATES, SOIL, SAND, OR SILT) SHALL BE DOCUMENTED IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
22. HAZARDOUS MATERIALS USED DURING MAINTENANCE WILL NOT BE STORED WITHIN 50 FEET FROM STORM WATER FACILITIES. HAZARDOUS MATERIALS SHALL BE MANAGED AND STORED IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. A REGISTERED FIRST-RESPONSE, PROFESSIONAL HAZARDOUS MATERIALS CLEAN-UP/REMEDIATION SERVICE SHALL BE LOCALLY AVAILABLE ON CALL.
23. MAINTENANCE-RELATED TRASH WILL BE STORED IN AN APPROPRIATE RECEPTACLE WITH A COVER IN THE STAGING AREAS AT LEAST 150 FEET FROM STORM WATER FACILITIES, AND TRASH RECEPTACLES WILL BE EMPTIED/REMOVED REGULARLY (AT LEAST ONCE PER WEEK).
24. THE TREATMENT, STORAGE, AND DISPOSAL OF WASTEWATER DURING THE LIFE OF THE PROJECT MUST BE DONE IN ACCORDANCE WITH WASTE DISCHARGE REQUIREMENTS ESTABLISHED BY THE SAN DIEGO WATER BOARD PURSUANT TO CWC 13260.
25. CONSTRUCTION DEWATERING OPERATIONS ARE NOT ANTICIPATED FOR THE MAINTENANCE ACTIVITIES DUE TO DRY WEATHER EXCAVATION REQUIREMENTS. IF THEY ARE NEEDED, CONSTRUCTION DEWATERING OPERATIONS SHALL BE MANAGED FOLLOWING THE GUIDANCE OF BMP FACT SHEET NS-2. GROUNDWATER DEWATERING SHALL BE MANAGED IN ACCORDANCE WITH THE GENERAL WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM TEMPORARY GROUNDWATER EXTRACTION AND SIMILAR WASTE DISCHARGES TO SAN DIEGO BAY, TRIBUTARIES THERETO UNDER TIDAL INFLUENCE, AND STORM DRAINS OR OTHER CONVEYANCE SYSTEMS TRIBUTARY THERETO (WDR) ORDER NO. R9-2007-0034, NPDES NO. CAG919001.
26. SANITARY FACILITIES WILL BE PROVIDED ONSITE FOR THE USE OF PERSONNEL AND WILL BE PROPERLY MAINTAINED, INCLUDING BEING EQUIPPED WITH SECONDARY CONTAINMENT FOLLOWING THE GUIDANCE OF BMP FACT SHEET WM-9
27. SPILLS SHALL BE MANAGED FOLLOWING THE GUIDANCE OF BMP FACT SHEET WM-4. SPILL CLEANUP MATERIALS SHALL BE AVAILABLE ONSITE AT ALL TIMES.
28. MATERIAL USE, DELIVERY AND STORAGE SHALL BE MANAGED FOLLOWING THE GUIDANCE OF BMP FACT SHEETS WM-1 AND WM-2.
29. WATER SHALL BE CONSERVED FOLLOWING THE GUIDANCE OF BMP FACT SHEET NS-1 SO AS NOT TO ALLOW UNAUTHORIZED NON-STORMWATER DISCHARGES.
30. BMP MATERIAL SHALL BE STORED ONSITE TO PROVIDE COMPLETE PROTECTION OF EXPOSED AREAS AND PREVENT OFFSITE SEDIMENT TRANSPORT.
31. VEHICLE AND EQUIPMENT FUELING/MAINTENANCE SHALL BE MANAGED FOLLOWING THE GUIDANCE OF BMP FACT SHEETS NS-9 AND NS-10. THE FUELING AREA SHALL BE LOCATED AT LEAST 100 FEET AWAY FROM THE CHANNELS IN STAGING AREAS B AND D. NO ROUTINE MAINTENANCE AND NO STORAGE OF PETROLEUM PRODUCTS OR CHEMICALS ARE PREMITTED ONSITE. RE-FUELING WILL BE RESTRICTED TO HEAVY EARTH MOVING EQUIPMENT (NOT DUMP TRUCKS) AND RESTRICTED TO THE STAGING AREA. EQUIPMENT WILL BE INSPECTED DAILY FOR FLUID LEAKS AND PROMPTLY CLEANED UP.
32. STATIONARY EQUIPMENT (CRANES, MOTORS, PUMPS, ETC.) LOCATED IN OR ADJACENT TO THE CHANNELS SHALL BE POSITIONED OVER DRIP PANS.
33. THE CONTRACTOR SHALL PROVIDE EQUIPMENT NECESSARY TO EXTINGUISH SMALL BRUSH FIRES (FROM SPARKING VEHICLES, ETC.) ON-SITE DURING ALL PHASES OF PROJECT ACTIVITIES, ALONG WITH TRAINED PERSONNEL FOR USE OF SUCH EQUIPMENT.
34. THE CONTRACTOR SHALL MONITOR THE 5 DAY WEATHER FORECAST. IF ANY PRECIPITATION IS FORECASTED, THE SITE SHALL BE SECURED TO PREVENT ANY CONSTRUCTION RELATED MATERIALS FROM LEAVING THE SITE AND ENTERING THE CHANNELS. THE SITE SHALL BE COMPLETELY SECURED ONE DAY PRIOR TO EXPECTED PRECIPITATION UNLESS PRIOR WRITTEN APPROVAL IS PROVIDED BY THE DEPARTMENT OF FISH AND GAME (DFG). NO CONSTRUCTION ACTIVITIES SHALL OCCUR DURING RAIN EVENTS. IF THE AMOUNT OF RAINFALL ACCUMULATED IN THE WATERSHED IS ONE INCH OR GREATER, CONSTRUCTION ACTIVITES SHALL BE HALTED FOR TWO WEEKS OR UNTIL THE FLOWS HAVE RECEDED AND THE MOISTURE CONTENT OF THE SOILS HAVE STABILIZED.
35. SAMPLING AND ANALYSIS, MONITORING AND REPORTING, AND POST-MAINTENANCE MANAGEMENT OF THE PROJECT SHALL BE CONDUCTED AS DETERMINED NECESSARY BY THE CITY OF SAN DIEGO.
36. CHANNELS WILL BE INSPECTED WITHIN 72 HOURS OF THE FIRST 2-YEAR STORM FOLLOWING MAINTENANCE. IF SUBSTANTIAL EROSION HAS OCCURRED, EROSION CONTROL MEASURES RECOMMENDED BY THE FIELD ENGINEER WILL BE IMPLEMENTED TO REMEDIATE EROSION AREAS AND TO MINIMIZE FUTURE EROSION.
37. CONTRACTOR SHALL PROVIDE TRAINING FOR ALL PERSONNEL RESPONSIBLE FOR THE PROPER INSTALLATION, INSPECTION, AND MAINTENANCE OF ONSITE BMPs.
38. THE QUALIFIED CONTACT PERSON WILL ASSIGN A MONITOR FOR DAILY INSPECTION OF THE BMPs. EACH MORNING, THE MONITOR WILL CHECK THE NATIONAL WEATHER SERVICE FORECAST, COMPLETE BMP INSPECTION CHECKLIST, PERFORM ANY NECESSARY BMP MAINTENANCE/REPAIRS, AND REPORT THE RESULTS TO THE QUALIFIED CONTACT PERSON.COMPLETED INSPECTION CHECKLISTS WILL BE KEPT WITH THE WPCP.
39. PREVIOUSLY UNDISTURBED STAGING AREAS WILL BE REVEGETATED WITHIN 30 DAYS OF COMPLETION OF MAINTENANCE ACTIVITIES. THE REVEGETATED AREAS WILL BE MONITORED FOR A PERIOD OF NOT LESS THAN 25 MONTHS AFTER PLANTING.
40. FINAL LOCATION OF CHANNEL CENTERLINE WILL BE DETERMINED IN THE FIELD AND COORDINATED WITH NECESSARY PROJECT SPECIALISTS (BIOLOGIST, HISTORICAL MONITOR, ETC.).

MAINTENANCE PROCEDURE:

PRE-MAINTENANCE ACTIVITIES:

1. PRECONSTRUCTION MEETING - CONDUCT A PRE-MAINTENANCE MEETING ON-SITE PRIOR TO THE START OF ANY MAINTENANCE ACTIVITY. QUALIFIED SPECIALISTS SHALL: INDICATE/IDENTIFY ANY SENSITIVE BIOLOGICAL/HISTORICAL/WATER QUALITY RESOURCES TO BE AVOIDED DURING MAINTENANCE, FLAG/DELINEATE SENSITIVE RESOURCES TO BE AVOIDED DURING MAINTENANCE, REVIEW SPECIFIC MEASURES TO BE IMPLEMENTED TO MINIMIZE DIRECT/INDIRECT IMPACTS, AND DIRECT CREWS OR OTHER PERSONNEL TO PROTECT SENSITIVE RESOURCES AS NECESSARY.
2. TRAINING - CONDUCT TRAINING FOR PERSONNEL RESPONSIBLE FOR THE PROPER INSTALLATION, INSPECTION, AND MAINTENANCE OF ON-SITE BMPs.
3. BMP INSTALLATION - INSTALL CONSTRUCTION BMPs (SEDIMENT, EROSION CONTROL, ETC.) IN ACCORDANCE WITH THE WATER POLLUTION CONTROL PLAN ALONG ALL EXISTING ACCESS ROADS AND STAGING AREAS.
4. MOBILIZE EQUIPMENT AT STAGING AREAS B AND D.
5. PERFORM NECESSARY MAINTENANCE ACTIVITIES ALONG THE EXISTING ACCESS ROADS.

CHANNEL SEQUENCE

1. SMUGGLER'S GULCH (SG) NORTH OF DISNEY CROSSING TOWARD CONFLUENCE AND CULVERTS UNDER DISNEY CROSSING.
2. PILOT CHANNEL EAST OF CONFLUENCE TOWARDS HOLLISTER BRIDGE.
3. PILOT CHANNEL WEST OF CONFLUENCE TO SATURN BOULEVARD.
4. SG SOUTH OF DISNEY CROSSING TOWARD MONUMENT ROAD AND CULVERTS UNDER MONUMENT ROAD.

METHODOLOGY

1. SG NORTH OF DISNEY CROSSING TOWARD CONFLUENCE AND CULVERTS UNDER DISNEY CROSSING
   - 1.1. EQUIPMENT ENTERS SG AT TEMPORARY ACCESS RAMP NORTH OF DISNEY CROSSING.
   - 1.2. BULLDOZER PUSHES MATERIAL TO A CENTRAL LOCATION IN CHANNEL.
   - 1.3. EXCAVATOR STATIONED AT CENTRAL LOCATION SCOOPS ACCUMULATED MATERIAL AND LOADS INTO ROCK TRUCK
   - 1.4. ROCK TRUCK (USING DESIGNATED TURNAROUND AND ACCESS ROADS) HAULS MATERIAL TO STAGING AREA B
   - 1.5. PLACE BARRIERS AT TRAIL HEADS AND DISNEY CROSSING.
2. CULVERTS UNDER DISNEY BRIDGE
   - 2.1. SKID-STEER (BOBCAT) ENTERS SG AT TEMPORARY ACCESS RAMP.
   - 2.2. SKID-STEER PUSHES MATERIAL IN CULVERTS TO EXCAVATOR STATIONED AT ACCESS RAMP.
   - 2.3. EXCAVATOR LOADS ROCK TRUCK/DUMP TRUCK.
   - 2.4. ROCK/DUMP TRUCK HAULS MATERIAL TO STAGING AREA B.
3. SG SOUTH OF DISNEY CROSSING TOWARD MONUMENT ROAD
   - 3.1. BULLDOZER TO ENTER CHANNEL FROM DESIGNATED ACCESS POINT ALONG ACCESS ROUTE.
   - 3.2. BULLDOZER PUSHES MATERIAL TO CENTRAL LOCATION.
   - 3.3. EXCAVATOR STATIONED ON ACCESS ROAD SCOOPS MATERIAL FROM CENTRAL LOCATION.
   - 3.4. EXCAVATOR LOAD MATERIAL INTO ROCK TRUCK.
   - 3.5. ROCK TRUCK USES EXISTING ACCESS ROADS TO HAUL MATERIALS TO STAGING AREA B.
   - 3.6. MAINTENANCE SHALL BE PERFORMED SUCH THAT IDENTIFIED SENSITIVE RESOURCES ARE AVOIDED. SENSITIVE RESOURCES ARE LOCATED ON THE EARTHEN BERM OF SG AS INDICATED ON THE PLAN SHEETS.
4. CULVERTS UNDER MONUMENT ROAD
   - 4.1. VACTOR TRUCK STATIONED ON MONUMENT ROAD FLUSHES ACCUMULATED MATERIAL IN CULVERT AND VACUUMS MATERIAL.
   - 4.2. MATERIALS TO BE HAULED TO AN APPROPRIATE DISPOSAL FACILITY.
5. PILOT CHANNEL
   - 5.1. FOLLOW SG NORTH OF DISNEY CROSSING METHODOLOGY.
   - 5.2. CONSTRUCT NEW TURNAROUND ALONG NORTH BANK AND MAINTAIN EXISTING TURNAROUNDS.
   - 5.3. PERFORM INSPECTION/MAINTENANCE OF GABION ROCK MATTRESS LOCATED NEAR CONFLUENCE OF SG AND PILOT CHANNELS.
6. STAGING AREA B
   - 6.1. ROCK TRUCK TRANSPORTS/DUMPS SPOILS TO STAGING AREA B.
   - 6.2. BULLDOZER MANAGES STOCKPILE.
   - 6.3. LOADER DUMPS MATERIAL INTO DUMP TRUCK.
   - 6.4. DUMP TRUCK HAULS MATERIAL TO STAGING AREA D.
7. STAGING AREA D
   - 7.1. DUMP TRUCK TRANSPORTS/DUMPS SPOILS TO STAGING AREA D.
   - 7.2. BULLDOZER MANAGES STOCKPILE.
   - 7.3. BACKHOE SEPERATES AND SORTS MATERIALS (WASTE TIRES,VEGETATION, TRASH) FROM STOCKPILE.
   - 7.4. LOADER DUMPS MATERIAL INTO DUMP TRUCK.
   - 7.5. DUMPTRUCK HAULS TO APPROPRIATE DISPOSAL FACILITY.

POST-CONSTRUCTION

1. DEMOBILIZE EQUIPMENT.
2. REMOVE TEMPORARY CONSTRUCTION BMPS.

WORK PERFORMED 9/2013 - 3/2014

INTERIM AS-BUILT
PLANS FOR THE CONSTRUCTION OF

TIJUANA RIVER VALLEY

CONSTRUCTION BMP NOTES

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 9 OF 15 SHEETS

W.O. NO._____

OTHER BMP REQUIREMENTS:

1. THE MASTER LIST OF BMPs, INCLUDED AS APPENDIX B IN THE WPCP, SHOULD BE CONSULTED FOR ADDITIONAL BIOLOGICAL, CULTURAL, AND WATER QUALITY RELATED REQUIREMENTS.

2. AN ONSITE PRE-MAINTENANCE MEETING SHOULD BE CONDUCTED PRIOR TO THE START OF THE PROJECT. IN ATTENDANCE AT THE MEETING SHOULD BE THE: MAINTENANCE CONTRACTOR, CITY STORM WATER DIVISION REPRESENTATIVES, MITIGATION MONITORING COORDINATOR, QUALIFIED WATER QUALITY SPECIALIST, PROJECT BIOLOGIST/MONITOR, QUALIFIED ARCHAEOLOGIST/HISTORICAL MONITOR/PALEONTOLOGICAL MONITOR, AND ANY OTHER KEY PERSONNEL. SENSITIVE HISTORICAL AND BIOLOGICAL RESOURCES SHOULD BE IDENTIFIED TO BE AVOIDED DURING THE MAINTENANCE ACTIVITIES AS WELL AS ANY CONDITIONS FOR POSSIBLE NIGHT AND/OR WEEKEND WORK. THE WATER QUALITY SPECIALIST SHOULD IDENTIFY MITIGATION MEASURES, PROTOCOLS AND BMPs TO BE CARRIED OUT DURING THE MAINTENANCE. THE MASTER LIST OF BMPs PROVIDES DETAILED INFORMATION ON PROCEDURES TO BE FOLLOWED.

3. THE CITY SHALL NOTIFY DFG, IN WRITING, AT LEAST FIVE DAYS PRIOR TO INITIATION OF CONSTRUCTION (PROJECT) ACTIVITIES AND AT LEAST FIVE DAYS PRIOR TO COMPLETION OF CONSTRUCTION (PROJECT) ACTIVITIES, EACH TIME PROJECT ACTIVITIES OCCUR. NOTIFICATION SHALL BE SENT TO DFG'S SOUTH COAST OFFICE, ATTN: STREAMBED ALTERATION PROGRAM - SM # 1600-2011-0271-R5.

4. AVOID THE INTRODUCTION OF INVASIVE PLANT SPECIES WITH PHYSICAL EROSION CONTROL MEASURES.

5. REMOVE ARUNDO THROUGH ONE, OR A COMBINATION OF, THE FOLLOWING METHODS : (1) FOLIAR SPRAY (SPRAYING HERBICIDE ON LEAVES AND STEMS WITHOUT CUTTING FIRST) WHEN ARUNDO OCCURS IN MONOTYPIC STANDS, OR (2) CUT AND PAINT (CUTTING STEMS CLOSE TO THE GROUND AND SPRAYING OR PAINTING HERBICIDE ON CUT STEM SURFACE) WHEN ARUNDO IS INTERMIXED WITH NATIVE PLANTS. WHEN SEDIMENT SUPPORTING ARUNDO MUST BE REMOVED, THE SEDIMENT SHALL BE EXCAVATED TO A DEPTH SUFFICIENT TO REMOVE THE RHIZOMES, WHEREVER FEASIBLE. FOLLOWING REMOVAL OF SEDIMENT CONTAINING RHIZOMES, LOOSE RHIZOME MATERIAL SHALL BE REMOVED FROM THE CHANNEL AND DISPOSED OFFSITE. AFTER THE INITIAL TREATMENT, THE AREA OF REMOVAL SHALL BE INSPECTED ON A QUARTERLY BASIS FOR UP TWO YEARS, OR UNTIL NO RESPROUTING IS OBSERVED DURING AN INSPECTION. IF RESPROUTING IS OBSERVED, THE CUT AND PAINT METHOD SHALL BE APPLIED TO ALL RESPROUTS.

6. PRIOR TO COMMENCING ANY MAINTENANCE ACTIVITY WHICH MAY IMPACT SENSITIVE BIOLOGICAL RESOURCES, THE MONITORING BIOLOGIST SHALL VERIFY THAT THE FOLLOWING ACTIONS HAVE BEEN TAKEN, AS APPROPRIATE:
   - FENCING, FLAGGING, SIGNAGE, OR OTHER MEANS TO PROTECT SENSITIVE RESOURCES TO REMAIN AFTER MAINTENANCE HAS BEEN IMPLEMENTED;
   - NOISE ATTENUATION MEASURES NEEDED TO PROTECT SENSITIVE WILDLIFE ARE IN PLACE AND EFFECTIVE; AND/OR
   - NESTING RAPTORS HAVE BEEN IDENTIFIED AND NECESSARY MAINTENANCE SETBACKS HAVE BEEN ESTABLISHED IF MAINTENANCE IS TO OCCUR BETWEEN JANUARY 15 AND AUGUST 31. SEE THE MASTER LIST OF BMPs FOR ADDITIONAL INFORMATION.

7. A QUALIFIED BIOLOGICAL MONITOR THAT CAN RECOGNIZE CLAPPER RAILS AND THEIR VOCALIZATIONS SHALL BE PRESENT DURING ALL THE PROJECT MAINTENANCE ACTIVITY WITHIN THE CHANNELS, ENFORCE THE LIMITS OF MAINTENANCE AND ENSURE THAT NO HARM TO CLAPPER RAILS OCCURS. BEFORE EACH WORKDAY IN THE PILOT CHANNEL BEGINS, THE BIOLOGICAL MONITOR SHALL WALK UPSTREAM TO DOWNSTREAM ON EITHER SIDE OF THE CHANNEL TO EVALUATE IF CLAPPER RAILS HAVE ENTERED THE PROJECT AREA. THE BIOLOGICAL MONITOR WILL FOLLOW PROCEDURES OUTLINED IN THE MASTER LIST OF BMPs.

8. CONTRACTOR SHALL HAVE A QUALIFIED BIOLOGIST ON SITE DAILY DURING PROJECT ACTIVITY TO ENSURE THAT AGREEMENT CONDITIONS ARE BEING MET AND MINIMIZE IMPACTS TO HABITAT. THE BIOLOGIST WILL BE KNOWLEDGEABLE OF VIREO BIOLOGY AND ECOLOGY. THE BIOLOGIST SHALL BE AUTHORIZED TO STOP CONSTRUCTION IF NECESSARY TO PROTECT FISH AND WILDLIFE RESOURCES. IF ANY PROTECTED SPECIES ARE FOUND THE BIOLOGIST SHALL INFORM DFG. IF THERE IS A THREAT OF HARM TO ANY PROTECTED SPECIES OR OTHER AQUATIC WILDLIFE THE BIOLOGIST SHALL HALT CONSTRUCTION AND NOTIFY DFG. CONSULTATION WITH DFG IS REQUIRED BEFORE RE-COMMENCING WORK. THE QUALIFIED BIOLOGIST WILL FOLLOW PROCEDURES OUTLINED IN THE MASTER LIST OF BMPs.

9. IF ANY WILDLIFE IS ENCOUNTERED DURING THE COURSE OF CONSTRUCTION, SAID WILDLIFE SHALL BE ALLOWED TO LEAVE THE CONSTRUCTION AREA UNHARMED.

10. PRIOR TO THE START OF MAINTENANCE ACTIVITIES, ALL HISTORICAL RESOURCES AREAS SHALL BE FLAGGED, CAPPED OR FENCED.

11. AREAS IDENTIFIED AS MODERATE TO HIGH POTENTIAL FOR THE OCCURRENCE OF SIGNIFICANT HISTORICAL RESOURCES SHALL BE IDENTIFIED FOLLOWING THE PROCEDURES OUTLINES IN THE MASTER LIST OF BMPs. AN ARCHAEOLOGICAL MONITOR SHALL BE PRESENT ONSITE FULL TIME DURING CONSTRUCTION ACTIVITIES IN AREAS IDENTIFIED AS ARCHEOLOGICAL RESOURCES.

12. IF HUMAN REMAINS ARE DISCOVERED, WORK SHALL HALT IN THAT AREA AND NO SOIL SHALL BE EXPORTED OFF-SITE UNTIL A DETERMINATION CAN BE MADE. THE PROCEDURES OUTLINED IN THE MASTER LIST OF BMPs SHALL BE FOLLOWED.

13. IF A LISTED SPECIES IS LOCATED WITHIN 500 FEET OF A PROPOSED MAINTENANCE ACTIVITY AND MAINTENANCE WOULD OCCUR DURING THE ASSOCIATED BREEDING SEASON, AN ANALYSIS OF THE NOISE GENERATED BY MAINTENANCE ACTIVITY SHALL BE COMPLETED BY A QUALIFIED ACOUSTICIAN (POSSESSING CURRENT NOISE ENGINEER LICENSE OR REGISTRATION WITH MONITORING NOISE LEVEL EXPERIENCE WITH LISTED ANIMAL SPECIES) AND APPROVED BY THE ADD ENVIRONMENTAL DESIGNEE. THE MASTER LIST OF BMPs PROVIDES DETAILED INFORMATION ON PROCEDURES TO BE FOLLOWED.

14. ALL LIGHTING ADJACENT TO, OR WITHIN, THE MHPA SHALL BE SHIELDED, UNIDIRECTIONAL, LOW PRESSURE SODIUM ILLUMINATION (OR SIMILAR) AND DIRECTED AWAY FROM SENSITIVE AREAS USING APPROPRIATE PLACEMENT AND SHIELDS. IF LIGHTING IS REQUIRED FOR NIGHTTIME MAINTENANCE, IT SHALL BE DIRECTED AWAY FROM THE PRESERVE AND THE TOPS OF ADJACENT TREES WITH POTENTIALLY NESTING RAPTORS, USING APPROPRIATE PLACEMENT AND SHIELDING.

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ENVIRONMENTAL MITIGATION REQUIREMENTS:

CHAPTER 11.0 MITIGATION MONITORING AND REPORTING PROGRAM

Section 21081.6 of the State of California Public Resources Code requires a Lead or Responsible Agency that approves or carries out a project where an environmental impact report (EIR) has identified significant environmental effects to adopt a "reporting or monitoring program for adopted or required changes to mitigate or avoid significant environmental effects." The City of San Diego is the lead Agency for the Master Program PEIR, and, therefore, is responsible for implementation of the MMRP. Because the PEIR recommends measures to mitigate these impacts, an MMRP is required to ensure that adopted mitigation measures are implemented.

As Lead Agency for the proposed project under CEQA, the City of San Diego will administer the MMRP for the following environmental issue areas: biological resources, historical resources, land use policies, paleontological resources, and water quality.

GENERAL

General Mitigation 1: Prior to commencement of work, the ADD Environmental Designee of the Entitlements Division shall verify that mitigation measures for impacts to biological resources (Mitigation Measures 4.3.1 through 4.3.20), historical resources (Mitigation Measures 4.4.1 and 4.4.2), land use policy (Mitigation Measures 4.1.1 through 4.1.13), paleontological resources (Mitigation Measure 4.7.1), and water quality (Mitigation Measures 4.8.1 through 4.8.3) have been included in entirety on the submitted maintenance documents and contract specifications, and included under the heading, "Environmental Mitigation Requirements." In addition, the requirements for a Pre-maintenance Meeting shall be noted on all maintenance documents.

General Mitigation 2: Prior to the commencement of work, a Pre-maintenance Meeting shall be conducted and include, as appropriate, the MMC, SWD Project Manager, Biological Monitor, Historical Monitor, Paleontological Monitor, Water Quality Specialist, and Maintenance Contractor, and other parties of interest.

General Mitigation 3: Prior to the commencement of work, evidence of compliance with other permitting authorities is required, if applicable. Evidence shall include either copies of permits issued, letters of resolution issued by the Responsible Agency documenting compliance, or other evidence documenting compliance and deemed acceptable by the ADD Environmental Designee.

General Mitigation 4: Prior to commencement of work and pursuant to Section 1600 et seq. of the State of California Fish & Game Code, evidence of compliance with Section 1605 is required, if applicable. Evidence shall include either copies of permits issued, letters of resolution issued by the Responsible Agency documenting compliance, or other evidence documenting compliance and deemed acceptable by the ADD Environmental Designee.

BIOLOGICAL RESOURCES

Potential impacts to biological resources would be reduced to below a level of significance through implementation of the following mitigation measures as well as Mitigation Measures 4.1-1 through 4.1-25.

Mitigation Measure 4.3.1: Prior to commencement of any activity within a specific annual maintenance program, a qualified biologist shall prepare an IBA for each area proposed to be maintained. The IBA shall be prepared in accordance with the specifications included in the Master Program.

Mitigation Measure 4.3.2: No maintenance activities within a proposed annual maintenance program shall be initiated before the City's Assistant Deputy Director (ADD) Environmental Designee and state and federal agencies with jurisdiction over maintenance activities have approved the IMPs and IBAs including proposed mitigation for each of the proposed activities. In their review, the ADD Environmental Designee and agencies shall confirm that the appropriate maintenance protocols have been incorporated into each IMP.

Mitigation Measure 4.3.3: No maintenance activities within a proposed annual maintenance program shall be initiated until the City's ADD Environmental Designee and Mitigation Monitoring Coordinator (MMC) have approved the qualifications for biologist(s) who shall be responsible for monitoring maintenance activities which may impact sensitive biological resources.

Mitigation Measure 4.3.4: Prior to undertaking any maintenance activity included in an annual maintenance program, a mitigation account shall be established to provide sufficient funds to implement all biological mitigation associated with the proposed maintenance activities. The fund amount shall be determined by the ADD Environmental Designee. The account shall be managed by the City's SWD, with quarterly status reports submitted to DSD. The status reports shall separately identify upland and wetland account activity. Based upon the impacts identified in the IBAs, money shall be deposited into the account, as part of the project submittal, to ensure available funds for mitigation.

Mitigation Measure 4.3.5: Prior to commencing any activity that could impact wetlands, evidence of compliance with other permitting authorities is required, if applicable. Evidence shall include copies of permits issued, letters of resolution issued by the Responsible Agency documenting compliance, or other evidence documenting compliance and deemed acceptable by the ADD Environmental Designee.

Mitigation Measure 4.3.6: Prior to commencing any activity where the IBA indicates significant impacts to biological resources may occur, a pre-maintenance meeting shall be held on site with the following in attendance: City's SWD Maintenance Manager (MM), MMC, and Maintenance Contractor (MC). The biologist selected to monitor the activities shall be present. At this meeting, the monitoring biologist shall identify and discuss the maintenance protocols that apply to the maintenance activities.

At the pre-maintenance meeting, the monitoring biologist shall submit to the MMC and MC a copy of the maintenance plan (reduced to 11"x17") that identifies areas to be protected, fenced, and monitored. This data shall include all planned locations and design of noise attenuation walls or other devices. The monitoring biologist also shall submit a maintenance schedule to the MMC and MC indicating when and where monitoring is to begin and shall notify the MMC of the start date for monitoring.

Mitigation Measure 4.3.7: Within three months following the completion of mitigation monitoring, two copies of a written draft report summarizing the monitoring shall be prepared by the monitoring biologist and submitted to the MMC for approval. The draft monitoring report shall describe the results including any remedial measures that were required. Within 90 days of receiving comments from the MMC on the draft monitoring report, the biologist shall submit one copy of the final monitoring report to the MMC.

Mitigation Measure 4.3.8: Within six months of the end of an annual storm water facility maintenance program, the monitoring biologist shall complete an annual report which shall be distributed to the following agencies: the City of San Diego DSD, CDFG, RWQCB, USFWS, and Corps. At a minimum, the report shall contain the following information:

- Tabular summary of the biological resources impacted during maintenance and the mitigation;
- Master table containing the following information for each individual storm water facility or segment which is regularly maintained;
- Date and type of most recent maintenance;
- Description of mitigation which has occurred; and
- Description of the status of mitigation which has been implemented for past maintenance activities.

Mitigation Measure 4.3.9: Wetland impacts resulting from maintenance shall be mitigated in one of the following ~~three~~ two ways: (1) habitat creation, restoration, and/or enhancement ~~concurrent with maintenance, (2) habitat creation, restoration, and/or enhancement prior to maintenance,~~ or (~~3~~2) mitigation credits. The amount of mitigation ~~When mitigation is proposed to be accomplished through concurrent creation, restoration or enhancement, the amount of planting~~ shall be in accordance with ratios in Table 4.3-10 unless different mitigation ratios are required by state or federal agencies with jurisdiction over the impacted wetlands. In this event, the mitigation ratios required by these agencies will supersede, and not be in addition to, the ratios defined in Table 4.3-10. ~~When previously created, restored or enhanced wetland habitat is proposed to be used for mitigation, the ratio shall be 1:1, provided the habitat has been determined to be successfully established by the ADD Environmental Designee in consultation with the Resource Agencies prior to commencing the maintenance activity. Mitigation credits may be used at a ratio of 1:1, provided the mitigation credits are from a mitigation bank which has been approved by the Resource Agencies.~~ No maintenance shall commence until the ADD Environmental Designee has

determined that mitigation proposed for a specific maintenance activity meets one of these ~~three~~ two options.

Table 4.3-10
WETLAND MITIGATION RATIOS

WETLAND TYPE	MITIGATION RATIO[1]
Southern riparian forest	3:1
Southern sycamore riparian woodland	3:1
Riparian woodland	3:1
Coastal saltmarsh	4:1
Coastal brackish marsh	4:1
Southern willow scrub	2:1
Mule fat scrub	2:1
Riparian scrub[1]	2:1
Freshwater marsh[2]	~~1~~2:1
Cismontane alkali marsh	4:1
Disturbed wetland	~~1~~2:1
Streambed/natural flood channel	~~NA~~2:1

[1] Mitigation ratio within the Coastal Zone will be 3:1
[2] Mitigation ratio within the Coastal Zone will be 4:1~~Mitigation done in advance or through purchase of mitigation credits would be at a 1:1 ratio.~~

Mitigation locations for wetland impacts shall be selected using the following order of preference, based on the best mitigation value to be achieved.

1. Within impacted watershed, within City limits.
2. Within impacted watershed, outside City limits on City-owned or other publicly-owned land.
3. Outside impacted watershed, within City limits.
4. Outside impacted watershed, outside City limits on City-owned or other publically-owned land.

In order to mitigate for impacts in an area outside the limits of the watershed within which the impacts occur, the SWD must demonstrate to the satisfaction of the ADD Environmental Designee in consultation with the Resource Agencies that no suitable location exists within the impacted watershed.

Mitigation Measure 4.3.10: Whenever maintenance will impact wetland vegetation, a wetland mitigation plan shall be prepared in accordance with the Conceptual Wetland Restoration Plan contained in Appendix H of the Biological Technical Report, included as Appendix D.3 of the PEIR.

Mitigation which involves habitat enhancement, restoration or creation shall include a wetland mitigation plan containing the following information:

- Conceptual planting plan including planting zones, grading, and irrigation;
- Seed mix/planting palette;
- Planting specifications;
- Monitoring program including success criteria; and
- Long-term maintenance and preservation plan.

Mitigation which involves habitat acquisition and preservation shall include the following:

- Location of proposed acquisition;
- Description of the biological resources to be acquired including support for the conclusion that the acquired habitat mitigates for the specific maintenance impact; and
- Documentation that the mitigation area would be adequately preserved and maintained in perpetuity.

Mitigation which involves the use of mitigation credits shall include the following:

- Location of the mitigation bank;
- Description of the credits to be acquired including support for the conclusion that the acquired habitat mitigates for the specific maintenance impact; and
- Documentation that the credits are associated with a mitigation bank which has been approved by the appropriate Resource Agencies.

Mitigation Measure 4.3.11: Upland impacts shall be mitigated through payment into the City's Habitat Acquisition Fund, acquisition and preservation of specific land, or purchase of mitigation credits in accordance with the ratios identified in Table 4.3-11. Upland mitigation shall be completed within six months of the date the related maintenance has been completed.

Table 4.3-11
UPLAND HABITAT MITIGATION RATIOS[1]

Vegetation Type	Tier	Location of Impact with Respect to the MHPA	
		Inside	Outside
Coast live oak woodland	I	2:1	1:1
Scrub oak chaparral	I	2:1	1:1
Southern foredunes	I	2:1	1:1
Beach	I	2:1	1:1
Diegan coastal sage scrub	II	1:1	1:1
Coastal sage-chaparral scrub	II	1:1	1:1
Broom baccharis scrub	II	1:1	1:1
Southern mixed chaparral	IIA	1:1	0.5:1
Non-native grassland	IIIB	1:1	0.5:1
Eucalyptus woodland	IV	--	--
Non-native vegetation/ornamental	IV	--	--
Disturbed habitat/ruderal	IV	--	--
Developed	IV	--	--

[1]Assumes mitigation occurs within an MHPA

Mitigation Measure 4.3.12: Loss of habitat for the coastal California gnatcatcher shall be mitigated through the acquisition of suitable habitat or mitigation credits at a ratio of 1:1. Mitigation shall take place within the MHPA, and shall be accomplished within six months of the date maintenance is completed.

Mitigation Measure 4.3.13: Prior to commencing any maintenance activity which may impact sensitive biological resources, the monitoring biologist shall verify that the following actions have been taken, as appropriate:

- Fencing, flagging, signage, or other means to protect sensitive resources to remain after maintenance have been implemented;
- Noise attenuation measures needed to protect sensitive wildlife are in place and effective; and/or
- Nesting raptors have been identified and necessary maintenance setbacks have been established if maintenance is to occur between January 15 and August 31.

The designated biological monitor shall be present throughout the first full day of maintenance, whenever mandated by the associated IBA. Thereafter, through the duration of the maintenance activity, the monitoring biologist shall visit the site weekly to confirm that measures required to protect sensitive resources (e.g., flagging, fencing, noise barriers) continue to be effective. The monitoring biologist shall document monitoring events via a Consultant Site Visit Record. This record shall be sent to the MM each month. The MM will forward copies to MMC.

Mitigation Measure 4.3.14: Whenever off-site mitigation would result in a physical disturbance to the proposed mitigation area, the City will conduct an environmental review of the proposed mitigation plan in accordance with CEQA. If the off-site mitigation would have a significant impact on biological resources associated with the mitigation site, mitigation measures will be identified and implemented in accordance with the MMRP resulting from that CEQA analysis.

Mitigation Measure 4.3.15: Impacts to listed or endemic sensitive plant species shall be offset through implementation of one or a combination of the following actions:

- Impacted plants would be salvaged and relocated;
- Seeds from impacted plants would be collected for use at an off-site location;
- Off-site habitat that supports the species impacted shall be enhanced and/or supplemented with seed collected on site; and/or
- Comparable habitat at an off-site location shall be preserved.

Mitigation which involves relocation, enhancement or transplanting sensitive plants shall include the following:

- Conceptual planting plan including grading and, if appropriate, temporary irrigation;
- Planting specifications;
- Monitoring Program including success criteria; and
- Long-term maintenance and preservation plan.

Mitigation Measure 4.3.16: Maintenance activities shall not occur within the following areas:

- 300 feet from any nesting site of Cooper's hawk (*Accipiter cooperii*);
- 1,500 feet from known locations of the southern pond turtle (*Clemmys marmorata pallida*);
- 900 feet from any nesting sites of northern harriers (*Circus cyaneus*);
- 4,000 feet from any nesting sites of golden eagles (*Aquila chrysaetos*); or
- 300 feet from any occupied burrow or burrowing owls (*Athene cunicularia*).

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Mitigation Measure 4.3.17: If evidence indicates the potential is high for a listed species to be present, based on historical records or site conditions, then clearing, grubbing, or grading (inside and outside the MHPA) shall be restricted during the breeding season where development may impact the following species:

- Light-footed clapper rail (between February 15 and August 15);
- Western snowy plover (between March 1 and September 15);
- Least tern (between April 1 and September 15);
- Cactus wren (between February 15 and August 15); or
- Tricolored black bird (between March 1 and August 1.

When other sensitive species, including, but not limited to, the arroyo toad, burrowing owl, or Quino checkerspot butterfly are known or suspected to be present all appropriate protocol surveys and mitigation measures shall be implemented.

Mitigation Measure 4.3.18: If a subject species is not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the ADD Environmental Designee and an applicable resource agency which demonstrates whether or not mitigation measures such as noise walls are necessary between the dates stated above for each species. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.

Mitigation Measure 4.3.19: If the SWD chooses not to do the required surveys, then it shall be assumed that the appropriate avian species are present and all necessary protection and mitigation measures shall be required as described in Mitigation Measure 4.3.21

Mitigation Measure 4.3.20: If no surveys are completed and no sound attenuation devices are installed, it will be assumed that the habitat in question is occupied by the appropriate species and that maintenance activities would generate more than 60dB(A) L_{eq} within the habitat requiring protection. All such activities adjacent to the protected habitat shall cease for the duration of the breeding season of the appropriate species and a qualified biologist shall establish a limit of work.

Mitigation Measure 4.3.21: If maintenance occurs during the raptor breeding season (January 15 to August 31), a pre-maintenance survey for active raptor nests shall be conducted in areas supporting suitable habitat. If active raptor nests are found, maintenance shall not occur within 300 feet of a Cooper's hawk nest, 900 feet of a northern harrier's nest, or 500 feet of any other raptor's nest until any fledglings have left the nest.

Mitigation Measure 4.3.22: If removal of any eucalyptus trees or other trees used by raptors for nesting within a maintenance area is proposed during the raptor breeding season (January 15 through August 31), a qualified biologist shall ensure that no raptors are nesting in such trees. If

maintenance occurs during the raptor breeding season, a pre-maintenance survey shall be conducted and no maintenance shall occur within 300 feet of any nesting site of Cooper's hawk or other nesting raptor until the young fledge. Should the biologist determine that raptors are nesting, the trees shall not be removed until after the breeding season. In addition, if removal of grassland or other habitat appropriate for nesting by northern harriers, a qualified biologist shall ensure that no harriers are nesting in such areas. If maintenance occurs during the raptor breeding season, a pre-maintenance survey shall be conducted and no maintenance shall occur within 900 feet of any nesting site of northern harrier until the young fledge.

Mitigation Measure 4.3.23: If maintenance activities would occur at known localities for listed fish species or within suitable habitat for other highly sensitive aquatic species (i.e., southwestern pond turtle), avoidance or minimization measures (i.e., exclusionary fencing, dewatering of the activity area, live-trapping, and translocation to suitable habitat) must be implemented.

Mitigation Measure 4.3.24: If maintenance activities will occur within areas supporting listed and/or narrow endemic plants, the boundaries of the plant populations designated sensitive by the resource agencies will be clearly delineated with flagging or temporary fencing that must remain in place for the duration of the activity.

Mitigation Measure 4.3.25: In order to avoid impacts to nesting avian species, including those species not covered by the MSCP, maintenance within or adjacent to avian nesting habitat shall occur outside of the avian breeding season (January 15 to August 31) unless postponing maintenance would result in a threat to human life or property.

HISTORICAL RESOURCES

Potential impacts to historical resources would be reduced to below a level of significance through implementation of the following mitigation measures.

Mitigation Measure 4.4.1: Prior to commencement of the first occurrence of maintenance activity within a drainage facility included in the Master Program, an archaeologist, meeting the qualifications specified by the City's HRG, shall determine the potential for significant historical resources to occur in the maintenance area. If the archaeologist determines that the potential is moderate to high, an IHA shall be prepared. Based on the IMP for the proposed maintenance activity, the archaeologist shall determine the APE, which shall include access, staging, and maintenance areas. The IHA shall include a field survey of the APE with a Native American monitor, using the standards of the City's HRG. In addition, the archaeologist shall request a record search from the SCIC. Based on the results of the field survey and record search, the archaeologist shall conduct an archaeological testing program for any identified historical resources, using the standards of the City's HRG. If significant historical resources are identified, they shall be taken to the Historical Resources Board for designation as Historic Sites. Avoidance or implementation of an Archaeological Data Recovery Program (ADRP) and Archaeological Monitoring Program shall be required to mitigate project impacts to significant historical resources. The archaeologist shall prepare a report in accordance with City guidelines. At a minimum, the IHA report shall include:

- Description of maintenance to be performed, including length, width, and depth;

- Prehistory and History Background Discussion;
- Results of Record Search;
- Survey Methods;
- Archaeological Testing Methods;
- Impact Analysis; and
- Mitigation Recommendations, including avoidance or implementation of an ADRP and archaeological monitoring program.

In the event that the IHA indicates that no significant historical resources occur within the APE, or have the potential to occur within the APE, no further action shall be required.

Mitigation Measure 4.4.2: Prior to initiating any maintenance activity where the IHA identifies existing significant historical resources within the APE, the following actions shall be taken.

4.4.2.1 The Storm Water Department shall select a Principal Investigator (PI), who shall be approved by the ADD Environmental Designee. The PI must meet the requirements of the City's HRG.

4.4.2.2 Mitigation recommendations from the IHA shall be incorporated into the IMP to the satisfaction of the PI and the ADD Environmental Designee. Typical mitigation measures shall include but not be limited to: delineating resource boundaries on maintenance plans; implementing protective measures such as fencing, signage or capping; and selective monitoring during maintenance activities.

4.4.2.3 If impacts to significant historical resources cannot be avoided, the PI shall prepare an Archaeological Research Design and Data Recovery Program (ARDDRP) for the affected resources, with input from a Native American consultant, and the ARDDRP shall be approved by the ADD Environmental Designee. Based on the approved research design, a phased excavation program shall be conducted, which will include the participation of a Native American. The sample size to be excavated shall be determined by the PI, in consultation with City staff. The sample size shall vary with the nature and size of the archaeological site, but need not exceed 15 percent of the overall resource area. The area involved in the ARDDRP shall be surveyed, staked and flagged by the archaeological monitor, prior to commencing maintenance activities which could affect the identified resources.

4.4.2.4 A pre-maintenance meeting shall be held on-site prior to commencing any maintenance that may impact a significant historical resource. The meeting shall include representatives from the PI, the Native American consultant, Storm Water Department, Mitigation Monitoring Coordinator (MMC), Resident Engineer (RE), and Maintenance

Contractor (MC). The PI shall explain mitigation measures which must be implemented during maintenance. The PI shall also confirm that all protective measures (e.g. fencing, signage or capping) are in place.

4.4.2.5 If human remains are discovered in the course of conducting the ARDDRP, work shall be halted in that area and the following procedures set forth in the California Public Resources Code (Sec. 5097.98) and State Health and Safety Code (Sec. 7050.5) will be taken:

- The PI shall notify the RE, and the MMC. The MMC will notify the appropriate Senior Planner in the Environmental Analysis Section (EAS).
- The PI shall notify the Medical Examiner, after consultation with the RE, either in person or via telephone.
- Work will be redirected away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a determination can be made by the Medical Examiner, in consultation with the PI, concerning the provenience of the remains.
- The Medical Examiner, in consultation with the PI, shall determine the need for a field examination to determine the provenience.
- If a field examination is not warranted, the Medical Examiner shall determine, with input from the PI, if the remains are or are most likely to be of Native American origin.
- If Human Remains are determined to be Native American, the Medical Examiner shall notify the Native American Heritage Commission (NAHC). The NAHC shall contact the PI within 24 hours after the Medical Examiner has completed coordination. The NAHC will identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information. The PI will coordinate with the MLD for additional coordination. If (1) the NAHC is unable to identify the MLD, or the MLD fails to make a recommendation within 24 hours after being notified by the Commission; or (2) the landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with PRC 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner, then the landowner or their authorized representative shall re-inter the human remains and all associated grave goods with appropriate dignity, on the property in a location not subject to subsurface disturbance. Information on this process will be provided to the NAHC.
- If Human Remains are not Native American, the PI shall contact the Medical Examiner and notify them of the historic era context of the burial. The Medical Examiner shall determine the appropriate course of action with the PI and City staff (PRC 5097.98). If the remains are of historic origin, they shall be appropriately removed and conveyed to the Museum of Man for analysis. The decision for reinterment of the human remains shall be made in consultation with MMC, EAS, the landowner, and the Museum.

4.4.2.6 The PI shall be responsible for ensuring: (1) that all cultural materials collected are cleaned, catalogued and permanently curated with an appropriate institution; (2) that a letter of acceptance from the curation institution has been submitted to MMC; (3) that all artifacts are analyzed to identify function and chronology as they relate to the history of the area; (4) that faunal material is identified as to species; and (5) that specialty studies are completed, as appropriate. Curation of artifacts associated with the survey, testing and/or data recovery for this project shall be completed in consultation with LDR and the Native American representative, as applicable.

4.4.2.7 The Archaeologist shall be responsible for updating the appropriate State of California Department of Park and Recreation forms-DPR 523 A/B associated with the ARDDRP in accordance with the City's Historical Resources Guidelines, and submittal of such forms to the SCIC with the Final Results Report.

4.4.2.8 The PI shall prepare a Draft Results Report (even if negative) that describes the results, analysis and conclusions of the ARDDRP (with appropriate graphics). The MMC shall return the Draft Results Report to the PI for revision or for preparation of the Final Report. The PI shall submit the revised Draft Results Report to MMC for approval. The MMC shall provide written verification to the PI of the approved report. The MMC shall verify that the RE of receipt of all Draft Result Report submittals and approvals. The MMC shall notify the RE of receipt of the Final Results Report.

Mitigation Measure 4.4.3: Prior to initiating any maintenance activity where the IHA identifies a moderate to high potential for the occurrence of significant historical resources within the APE, the following actions shall be taken:

4.4.3.1 Prior to Permit Issuance or Bid Opening/Bid Award

A. Entitlements Plan Check
   1. Prior to permit issuance or Bid Opening/Bid Award, whichever is applicable, the Assistant Deputy Director (ADD) Environmental designee shall verify that the requirements for Archaeological Monitoring and Native American monitoring have been noted on the applicable maintenance documents through the plan check process.

B. Letters of Qualification have been submitted to ADD
   1. Prior to Bid Award, the applicant shall submit a letter of verification to Mitigation Monitoring Coordination (MMC) identifying the Principal Investigator (PI) for the project and the names of all persons involved in the archaeological monitoring program, as defined in the City of San Diego Historical Resources Guidelines (HRG). If applicable, individuals involved in the archaeological monitoring program must have completed the 40-hour HAZWOPER training with certification documentation.
   2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the archaeological monitoring of the project meet the qualifications established in the HRG.

   3. Prior to the start of work, the applicant must obtain written approval from MMC for any personnel changes associated with the monitoring program.

4.4.3.2 Prior to Start of Maintenance

A. Verification of Records Search
   1. The PI shall provide verification to MMC that a site specific records search (1/4 mile radius) has been completed. Verification includes, but is not limited to a copy of a confirmation letter from South Coastal Information Center, or, if the search was in-house, a letter of verification from the PI stating that the search was completed.
   2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.
   3. The PI may submit a detailed letter to MMC requesting a reduction to the ¼ mile radius.

B. PI Shall Attend Pre-maintenance Meetings
   1. Prior to beginning any work that requires monitoring; the Applicant shall arrange a Pre-maintenance Meeting that shall include the PI, Native American consultant/monitor (where Native American resources may be impacted), Maintenance Manager (MM) and/or Grading Contractor, Resident Engineer (RE), Building Inspector (BI), if appropriate, and MMC. The qualified Archaeologist and Native American Monitor shall attend any grading/excavation related Pre-maintenance Meetings to make comments and/or suggestions concerning the Archaeological Monitoring program with the Maintenance Manager and/or Grading Contractor.
      a. If the PI is unable to attend the Pre-maintenance Meeting, the Applicant shall schedule a focused Pre-maintenance Meeting with MMC, the PI, RE, MM or BI, if appropriate, prior to the start of any work that requires monitoring.
   2. Acknowledgement of Responsibility for Curation (CIP or Other Public Projects)
      The applicant shall submit a letter to MMC acknowledging their responsibility for the cost of curation associated with all phases of the archaeological monitoring program.
   3. Identify Areas to be Monitored
      Prior to the start of any work that requires monitoring, the PI shall submit an Archaeological Monitoring Exhibit (AME) (with verification that the AME has been reviewed and approved by the Native American consultant/monitor when Native American resources may be impacted) based on the appropriate maintenance documents (reduced to 11x17) to MMC identifying the areas to be monitored including the delineation of grading/excavation limits.
      The AME shall be based on the results of a site specific records search as well as information regarding the age of existing pipelines, laterals and associated appurtenances and/or any known soil conditions (native or formation).
      MMC shall notify the PI that the AME has been approved.

   4. When Monitoring Will Occur
      a. Prior to the start of any work, the PI shall also submit a maintenance schedule to MMC through the RE indicating when and where monitoring will occur.
      b. The PI may submit a detailed letter to MMC prior to the start of work or during maintenance requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final maintenance documents which indicate conditions such as age of existing pipe to be replaced, depth of excavation and/or site graded to bedrock, etc., which may reduce or increase the potential for resources to be present.
   5. Approval of AME and Maintenance Schedule
      After approval of the AME by MMC, the PI shall submit to MMC written authorization of the AME and Maintenance Schedule from the MM.

4.4.3.3 During Maintenance

A. Monitor Shall be Present During Grading/Excavation/Trenching
   1. The Archaeological Monitor shall be present full-time during all soil disturbing and grading/excavation/trenching activities which could result in impacts to archaeological resources as identified on the AME. **The Maintenance Manager is responsible for notifying the RE, PI, and MMC of changes to any maintenance activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the AME.**
   2. The Native American consultant/monitor shall determine the extent of their presence during soil disturbing and grading/excavation/trenching activities based on the AME and provide that information to the PI and MMC. If prehistoric resources are encountered during the Native American consultant/monitor's absence, work shall stop and the Discovery Notification Process detailed in Sections 4.4.3.3.B-C and 4.4.3.4-A-D shall commence.
   3. The PI may submit a detailed letter to MMC during maintenance requesting a modification to the monitoring program when a field condition such as modern disturbance post-dating the previous grading/trenching activities, presence of fossil formations, or when native soils are encountered that may reduce or increase the potential for resources to be present.
   4. The archaeological and Native American consultant/monitor shall document field activity via the Consultant Site Visit Record (CSVR). The CSVR's shall be faxed by the MM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion**), and in the case of ANY discoveries. The RE shall forward copies to MMC.

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B. Discovery Notification Process
1. In the event of a discovery, the Archaeological Monitor shall direct the contractor to temporarily divert all soil disturbing activities, including but not limited to digging, trenching, excavating or grading activities in the area of discovery and in the area reasonably suspected to overlay adjacent resources and immediately notify the RE or BI, as appropriate.
2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.
3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.
4. No soil shall be exported off-site until a determination can be made regarding the significance of the resource specifically if Native American resources are encountered.

C. Determination of Significance
1. The PI and Native American consultant/monitor, where Native American resources are discovered shall evaluate the significance of the resource. If Human Remains are involved, follow protocol in Section 4.4.3.4 below.
a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required.
b. If the resource is significant, the PI shall submit an Archaeological Data Recovery Program (ADRP) and obtain written approval of the program from MMC, MM and RE. ADRP and any mitigation must be approved by MMC, RE and/or MM before ground disturbing activities in the area of discovery will be allowed to resume. **Note: If a unique archaeological site is also an historical resource as defined in CEQA Section 15064.5, then the limits on the amount(s) that a project applicant may be required to pay to cover mitigation costs as indicated in CEQA Section 21083.2 shall not apply.**
(1).Note: For pipeline trenching and other linear projects in the public Right-of-Way, the PI shall implement the Discovery Process for Pipeline Trenching projects identified below under "D."
c. If the resource is not significant, the PI shall submit a letter to MMC indicating that artifacts will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that no further work is required.
(1).Note: For Pipeline Trenching and other linear projects in the public Right-of-Way, if the deposit is limited in size, both in length and depth; the information value is limited and is not associated with any other resource; and there are no unique features/artifacts associated with the deposit, the discovery should be considered not significant.
(2).Note, for Pipeline Trenching and other linear projects in the public Right-of-Way, if significance cannot be determined, the Final Monitoring Report and Site Record (DPR Form 523A/B) shall identify the discovery as Potentially Significant.

D. Discovery Process for Significant Resources - Pipeline Trenching and other Linear Projects in the Public Right-of-Way
The following procedure constitutes adequate mitigation of a significant discovery encountered during pipeline trenching activities or for other linear project types within the Public Right-of-Way including but not limited to excavation for jacking pits, receiving pits, laterals, and manholes to reduce impacts to below a level of significance:
1. Procedures for documentation, curation and reporting
a. One hundred percent of the artifacts within the trench alignment and width shall be documented in-situ, to include photographic records, plan view of the trench and profiles of side walls, recovered, photographed after cleaning and analyzed and curated. The remainder of the deposit within the limits of excavation (trench walls) shall be left intact.
b. The PI shall prepare a Draft Monitoring Report and submit to MMC via the RE as indicated in Section 4.4.3.6-A.
c. The PI shall be responsible for recording (on the appropriate State of California Department of Park and Recreation forms-DPR 523 A/B) the resource(s) encountered during the Archaeological Monitoring Program in accordance with the City's Historical Resources Guidelines. The DPR forms shall be submitted to the South Coastal Information Center for either a Primary Record or SDI Number and included in the Final Monitoring Report.
d. The Final Monitoring Report shall include a recommendation for monitoring of any future work in the vicinity of the resource.

4.4.3.4 Discovery of Human Remains

If human remains are discovered, work shall halt in that area and no soil shall be exported off-site until a determination can be made regarding the provenance of the human remains; and the following procedures as set forth in CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98) and State Health and Safety Code (Sec. 7050.5) shall be undertaken:

A. Notification
1. Archaeological Monitor shall notify the RE or BI as appropriate, MMC, and the PI, if the Monitor is not qualified as a PI. MMC will notify the appropriate Senior Planner in the Environmental Analysis Section (EAS) of the Development Services Department to assist with the discovery notification process.
2. The PI shall notify the Medical Examiner after consultation with the RE, either in person or via telephone.

B. Isolate discovery site
1. Work shall be directed away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a determination can be made by the Medical Examiner in consultation with the PI concerning the provenience of the remains.
2. The Medical Examiner, in consultation with the PI, will determine the need for a field examination to determine the provenience.

3. If a field examination is not warranted, the Medical Examiner will determine with input from the PI, if the remains are or are most likely to be of Native American origin.

C. If Human Remains **ARE** determined to be Native American
1. The Medical Examiner will notify the Native American Heritage Commission (NAHC) within 24 hours. By law, **ONLY** the Medical Examiner can make this call.
2. NAHC will immediately identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information.
3. The MLD will contact the PI within 24 hours or sooner after the Medical Examiner has completed coordination, to begin the consultation process in accordance with CEQA Section 15064.5(e), the California Public Resources and Health & Safety Codes.
4. The MLD will have 48 hours to make recommendations to the property owner or representative, for the treatment or disposition with proper dignity, of the human remains and associated grave goods.
5. Disposition of Native American Human Remains will be determined between the MLD and the PI, and, if:
a. The NAHC is unable to identify the MLD, OR the MLD failed to make a recommendation within 48 hours after being notified by the Commission, OR;
b. The landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with PRC 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner, THEN
c. To protect these sites, the landowner shall do one or more of the following:
(1) Record the site with the NAHC;
(2) Record an open space or conservation easement; or
(3) Record a document with the County.
d. Upon the discovery of multiple Native American human remains during a ground disturbing land development activity, the landowner may agree that additional conferral with descendants is necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of such a discovery may be ascertained from review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree on the appropriate treatment measures the human remains and buried with Native American human remains shall be reinterred with appropriate dignity, pursuant to Section 5.4.3.5.c., above.

D. If Human Remains are **NOT** Native American
1. The PI shall contact the Medical Examiner and notify them of the historic era context of the burial.
2. The Medical Examiner will determine the appropriate course of action with the PI and City staff (PRC 5097.98).
3. If the remains are of historic origin, they shall be appropriately removed and conveyed to the San Diego Museum of Man for analysis. The decision for *internment* of the human remains shall be made in consultation with MMC, EAS, the applicant/landowner, any known descendant group, and the San Diego Museum of Man.

4.4.3.5 Night and/or Weekend Work

A. If night and/or weekend work is included in the contract
1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the Pre-maintenance meeting.
2. The following procedures shall be followed.
a. No Discoveries
In the event that no discoveries were encountered during night and/or weekend work, the PI shall record the information on the CSVR and submit to MMC via fax by 8AM of the next business day.
b. Discoveries
All discoveries shall be processed and documented using the existing procedures detailed in Sections 4.4.3.3 - During Maintenance, and 4.4.3.4 – Discovery of Human Remains. Discovery of human remains shall always be treated as a significant discovery.
c. Potentially Significant Discoveries
If the PI determines that a potentially significant discovery has been made, the procedures detailed under Sections 4.4.3.3 During Maintenance and 4.4.3.4- Discovery of Human Remains shall be followed.
d. The PI shall immediately contact the RE and MMC, or by 8AM of the next business day to report and discuss the findings as indicated in Section 4.4.3.3-B, unless other specific arrangements have been made.

B. If night and/or weekend work becomes necessary during the course of maintenance
1. The Maintenance Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.
2. The RE, or BI, as appropriate, shall notify MMC immediately.

C. All other procedures described above shall apply, as appropriate.

4.4.3.6 Post Maintenance

A. Submittal of Draft Monitoring Report
1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Historical Resources Guidelines (Appendix C/D) which describes the results, analysis, and conclusions of all phases of the Archaeological Monitoring Program (with appropriate graphics) to MMC via the RE for review and approval within 90 days following the completion of monitoring. **It should be noted that if the PI is unable to submit the Draft Monitoring Report within the allotted 90-day timeframe as a result of delays with analysis, special study results or other complex issues, a schedule shall be submitted to MMC establishing agreed due dates and the provision for submittal of monthly status reports until this measure can be met.**

a. For significant archaeological resources encountered during monitoring, the Archaeological Data Recovery Program or Pipeline Trenching Discovery Process shall be included in the Draft Monitoring Report.
b. Recording Sites with State of California Department of Parks and Recreation
The PI shall be responsible for recording (on the appropriate State of California Department of Park and Recreation forms-DPR 523 A/B) any significant or potentially significant resources encountered during the Archaeological Monitoring Program in accordance with the City's Historical Resources Guidelines, and submittal of such forms to the South Coastal Information Center with the Final Monitoring Report.
2. MMC shall return the Draft Monitoring Report to the PI via the RE for revision or, for preparation of the Final Report.
3. The PI shall submit revised Draft Monitoring Report to MMC via the RE for approval.
4. MMC shall provide written verification to the PI of the approved report.
5. MMC shall notify the RE or BI, as appropriate, of receipt of all Draft Monitoring Report submittals and approvals.

B. Handling of Artifacts
1. The PI shall be responsible for ensuring that all cultural remains collected are cleaned and catalogued.
2. The PI shall be responsible for ensuring that all artifacts are analyzed to identify function and chronology as they relate to the history of the area; that faunal material is identified as to species; and that specialty studies are completed, as appropriate.

C. Curation of artifacts: Accession Agreement and Acceptance Verification
1. The PI shall be responsible for ensuring that all artifacts associated with the survey, testing and/or data recovery for this project are permanently curated with an appropriate institution. This shall be completed in consultation with MMC and the Native American representative, as applicable.
2. When applicable to the situation, the PI shall include written verification from the Native American consultant/monitor indicating that Native American resources were treated in accordance with state law and/or applicable agreements. If the resources were reinterred, verification shall be provided to show what protective measures were taken to ensure no further disturbance occurs in accordance with Section 4.4.3.4 – Discovery of Human Remains, Subsection C.
3. The PI shall submit the Accession Agreement and catalogue record(s) to the RE or BI, as appropriate for donor signature with a copy submitted to MMC.
4. The RE or BI, as appropriate shall obtain signature on the Accession Agreement and shall return to PI with copy submitted to MMC.
5. The PI shall include the Acceptance Verification from the curation institution in the Final Monitoring Report submitted to the RE or BI and MMC.

D. Final Monitoring Report(s)
1. The PI shall submit one copy of the approved Final Monitoring Report to the RE or BI as appropriate, and one copy to MMC (even if negative), within 90 days after notification from MMC of the approved report.
2. The RE shall, in no case, issue the Notice of Completion until receiving a copy of the approved Final Monitoring Report from MMC which includes the Acceptance Verification from the curation institution.

LAND USE

Potential impacts to land use policies in the City's General Plan would be reduced to below a level of significance through implementation of the following mitigation measures.

Mitigation Measure 4.1.1: Prior to commencing maintenance on any storm water facility within, or immediately adjacent to, a Multi-Habitat Planning Area (MHPA), the ADD Environmental Designee shall verify that all MHPA boundaries and limits of work have been delineated on all maintenance documents.

Mitigation Measure 4.1.2: A qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(a) recovery permit) shall survey those habitat areas inside and outside the MHPA suspected to serve as habitat (based on historical records or site conditions) for the coastal California gnatcatcher, least Bell's vireo and/or other listed species. Surveys for the appropriate species shall be conducted pursuant to the protocol survey guidelines established by the U.S. Fish and Wildlife Service. When other sensitive species, including, but not limited to, the arroyo toad, burrowing owl, or Quino checkerspot butterfly are known or suspected to be present all appropriate protocol surveys and mitigation measures identified in Subchapter 4.3, Biological Resources, required shall be implemented.

Mitigation Measure 4.1.3: If a listed species is located within 500 feet of a proposed maintenance activity and maintenance would occur during the associated breeding season, an analysis of the noise generated by maintenance activities shall be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the ADD Environmental Designee. The analysis shall identify the location of the 60 dB(A) L_{eq} noise contour on the maintenance plan. The report shall also identify measures to be undertaken during maintenance to reduce noise levels.

Mitigation Measure 4.1.4: Based on the location of the 60 dB(A) L_{eq} noise contour and the results of the protocol surveys, the Project Biologist shall determine if maintenance has the potential to impact breeding activities of listed species. If one or more of the following species are determined to be significantly impacted by maintenance, then maintenance (inside and outside the MHPA) shall avoid the following breeding seasons unless it is determined that maintenance is needed to protect life or property.

- Coastal California gnatcatcher (between March 1 and August 15 inside the MHPA only; no restrictions outside MHPA);

- Least Bell's vireo (between March 15 and September 15); and
- Southwestern willow flycatcher (between May 1 and September 1).

Mitigation Measure 4.1.5: If maintenance is required during the breeding season for a listed bird to protect life or property, then the following conditions must be met:

- At least two weeks prior to the commencement of maintenance activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from maintenance activities shall not exceed 60 dB(A) hourly average at the edge of occupied habitat. Concurrent with the commencement of maintenance activities and the maintenance of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dB(A) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or biologist, then the associated maintenance activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season of the subject species, as noted above.

- Maintenance noise shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the maintenance activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the ADD, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of maintenance equipment and the simultaneous use of equipment.

- Prior to the commencement of maintenance activities that would disturb sensitive resources during the breeding season, the biologist shall ensure that all fencing, staking and flagging identified as necessary on the ground have been installed properly in the areas restricted from such activities.

- If noise attenuation walls or other devices are required to assure protection to identified wildlife, then the biologist shall make sure such devices have been properly constructed, located and installed.

Mitigation Measure 4.1.6: A pre-maintenance meeting shall be held with the Maintenance Contractor, City representative and the Project Biologist. The Project Biologist shall discuss the sensitive nature of the adjacent habitat with the crew and subcontractor. Prior to the pre-maintenance meeting, the following shall be completed:

- The Storm Water Division (SWD) shall provide a letter of verification to the Mitigation Monitoring Coordination Section stating that a qualified biologist, as defined in the City of San Diego Biological Resources Guidelines, has been retained to implement the

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projects MSCP monitoring Program. The letter shall include the names and contact information of all persons involved in the Biological Monitoring of the project. At least thirty days prior to the pre-maintenance meeting, the qualified biologist shall submit all required documentation to MMC, verifying that any special reports, maps, plans and time lines, such as but not limited to, revegetation plans, plant relocation requirements and timing, MSCP requirements, avian or other wildlife protocol surveys, impact avoidance areas or other such information has been completed and updated.

- The limits of work shall be clearly delineated. The limits of work, as shown on the approved maintenance plan, shall be defined with orange maintenance fencing and checked by the biological monitor before initiation of maintenance. All native plants or species of special concern, as identified in the biological assessment, shall be staked, flagged and avoided within Brush Management Zone 2, if applicable.

Mitigation Measure 4.1.7: Maintenance plans shall be designed to accomplish the following.

- Invasive non-native plant species shall not be introduced into areas adjacent to the MHPA. Landscape plans shall contain non-invasive native species adjacent to sensitive biological areas, as shown on the approved maintenance plan.

- All lighting adjacent to, or within, the MHPA shall be shielded, unidirectional, low pressure sodium illumination (or similar) and directed away from sensitive areas using appropriate placement and shields. If lighting is required for nighttime maintenance, it shall be directed away from the preserve and the tops of adjacent trees with potentially nesting raptors, using appropriate placement and shielding.

- All maintenance activities (including staging areas and/or storage areas) shall be restricted to the disturbance areas shown on the approved maintenance plan. The project biologist shall monitor maintenance activities, as needed, to ensure that maintenance activities do not encroach into biologically sensitive areas beyond the limits of work as shown on the approved maintenance plan.

- No trash, oil, parking or other maintenance-related activities shall be allowed outside the established maintenance areas including staging areas and/or storage areas, as shown on the approved maintenance plan. All maintenance related debris shall be removed off-site to an approved disposal facility.

- Access roads through MHPA-designated areas shall comply with the applicable policies contained in the "Roads and Utilities Construction and Maintenance Policies" identified in Section 1.4.2 of the City's Subarea Plan.

Mitigation Measure 4.1.8: Prior to commencing any maintenance in, or within 500 feet of any area determined to support coastal California gnatcatchers, the ADD Environmental Designee shall verify that the MHPA boundaries and the following project requirements regarding the coastal California gnatcatcher are shown on the maintenance plans:

NO MAINTENANCE ACTIVITIES SHALL OCCUR BETWEEN MARCH 1 AND AUGUST 15, THE BREEDING SEASON OF THE COASTAL CALIFORNIA GNATCATCHER, UNTIL THE FOLLOWING REQUIREMENTS HAVE BEEN MET TO THE SATISFACTION OF THE ADD ENVIRONMENTAL DESIGNEE:

a. A QUALIFIED BIOLOGIST (POSSESSING A VALID ENDANGERED SPECIES ACT SECTION 10(a)(1)(A) RECOVERY PERMIT) SHALL SURVEY THOSE HABITAT AREAS WITHIN THE MHPA THAT WOULD BE SUBJECT TO MAINTENANCE NOISE LEVELS EXCEEDING 60 DECIBELS [dB(A)] HOURLY AVERAGE FOR THE PRESENCE OF THE COASTAL CALIFORNIA GNATCATCHER. SURVEYS FOR THE COASTAL CALIFORNIA GNATCATCHER SHALL BE CONDUCTED PURSUANT TO THE PROTOCOL SURVEY GUIDELINES ESTABLISHED BY THE U.S. FISH AND WILDLIFE SERVICE WITHIN THE BREEDING SEASON PRIOR TO THE COMMENCEMENT OF ANY MAINTENANCE. IF GNATCATCHERS ARE PRESENT, THEN THE FOLLOWING CONDITIONS MUST BE MET:

   1. BETWEEN MARCH 1 AND AUGUST 15, MAINTENANCE OF OCCUPIED GNATCATCHER HABITAT SHALL BE PERMITTED. AREAS RESTRICTED FROM SUCH ACTIVITIES SHALL BE STAKED OR FENCED UNDER THE SUPERVISION OF A QUALIFIED BIOLOGIST; AND

   2. BETWEEN MARCH 1 AND AUGUST 15, NO MAINTENANCE ACTIVITIES SHALL OCCUR WITHIN ANY PORTION OF THE SITE WHERE MAINTENANCE ACTIVITIES WOULD RESULT IN NOISE LEVELS EXCEEDING 60 dB(A) HOURLY AVERAGE AT THE EDGE OF OCCUPIED GNATCATCHER HABITAT. AN ANALYSIS SHOWING THAT NOISE GENERATED BY MAINTENANCE ACTIVITIES WOULD NOT EXCEED 60 dB(A) HOURLY AVERAGE AT THE EDGE OF OCCUPIED HABITAT MUST BE COMPLETED BY A QUALIFIED ACOUSTICIAN (POSSESSING CURRENT NOISE ENGINEER LICENSE OR REGISTRATION WITH MONITORING NOISE LEVEL EXPERIENCE WITH LISTED ANIMAL SPECIES) AND APPROVED BY THE CITY MANAGER AT LEAST TWO WEEKS PRIOR TO THE COMMENCEMENT OF MAINTENANCE ACTIVITIES. PRIOR TO THE COMMENCEMENT OF MAINTENANCE ACTIVITIES DURING THE BREEDING SEASON, AREAS RESTRICTED FROM SUCH ACTIVITIES SHALL BE STAKED OR FENCED UNDER THE SUPERVISION OF A QUALIFIED BIOLOGIST; OR

   3. AT LEAST TWO WEEKS PRIOR TO THE COMMENCEMENT OF MAINTENANCE ACTIVITIES, UNDER THE DIRECTION OF A QUALIFIED ACOUSTICIAN, NOISE ATTENUATION MEASURES (e.g.,

BERMS, WALLS) SHALL BE IMPLEMENTED TO ENSURE THAT NOISE LEVELS RESULTING FROM MAINTENANCE ACTIVITIES WILL NOT EXCEED 60 dB(A) HOURLY AVERAGE AT THE EDGE OF HABITAT OCCUPIED BY THE COASTAL CALIFORNIA GNATCATCHER. CONCURRENT WITH THE COMMENCEMENT OF MAINTENANCE ACTIVITIES AND THE MAINTENANCE OF NECESSARY NOISE ATTENUATION FACILITIES, NOISE MONITORING* SHALL BE CONDUCTED AT THE EDGE OF THE OCCUPIED HABITAT AREA TO ENSURE THAT NOISE LEVELS DO NOT EXCEED 60 dB(A) HOURLY AVERAGE. IF THE NOISE ATTENUATION TECHNIQUES IMPLEMENTED ARE DETERMINED TO BE INADEQUATE BY THE QUALIFIED ACOUSTICIAN OR BIOLOGIST, THEN THE ASSOCIATED MAINTENANCE ACTIVITIES SHALL CEASE UNTIL SUCH TIME THAT ADEQUATE NOISE ATTENUATION IS ACHIEVED OR UNTIL THE END OF THE BREEDING SEASON (AUGUST 16).

* Maintenance noise shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the maintenance activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the ADD environmental designee, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of maintenance equipment and the simultaneous use of equipment.

b. IF COASTAL CALIFORNIA GNATCATCHERS ARE NOT DETECTED DURING THE PROTOCOL SURVEY, THE QUALIFIED BIOLOGIST SHALL SUBMIT SUBSTANTIAL EVIDENCE TO THE CITY MANAGER AND APPLICABLE RESOURCE AGENCIES WHICH DEMONSTRATES WHETHER OR NOT MITIGATION MEASURES SUCH AS NOISE WALLS ARE NECESSARY BETWEEN MARCH 1 AND AUGUST 15 AS FOLLOWS:

   1. IF THIS EVIDENCE INDICATES THE POTENTIAL IS HIGH FOR COASTAL CALIFORNIA GNATCATCHER TO BE PRESENT BASED ON HISTORICAL RECORDS OR SITE CONDITIONS, THEN CONDITION A.III SHALL BE ADHERED TO AS SPECIFIED ABOVE.

   2. IF THIS EVIDENCE CONCLUDES THAT NO IMPACTS TO THIS SPECIES ARE ANTICIPATED, NO MITIGATION MEASURES WOULD BE NECESSARY.

PALEONTOLOGICAL RESOURCES

Potential impacts to paleontological resources would be reduced to below a level of significance through implementation of the following mitigation measures.

***Mitigation Measure* 4.7.1**: Prior to initiating any maintenance activity where significant paleontological resources may occur within the APE, the following actions shall be taken.

4.7.1.1 Prior to Permit Issuance or Bid Opening/Bid Award

A. Entitlements Plan Check
   1. Prior to permit issuance or Bid Opening/Bid Award, whichever is applicable, the Assistant Deputy Director (ADD) Environmental designee shall verify that the requirements for Paleontological Monitoring have been noted on the appropriate maintenance documents.

B. Letters of Qualification have been submitted to ADD
   1. Prior to Bid Award, the applicant shall submit a letter of verification to Mitigation Monitoring Coordination (MMC) identifying the Principal Investigator (PI) for the project and the names of all persons involved in the paleontological monitoring program, as defined in the City of San Diego Paleontology Guidelines.
   2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the paleontological monitoring of the project.
   3. Prior to the start of work, the applicant shall obtain approval from MMC for any personnel changes associated with the monitoring program.

4.7.1.2 Prior to Start of Maintenance

A. Verification of Records Search
   1. The PI shall provide verification to MMC that a site specific records search has been completed. Verification includes, but is not limited to a copy of a confirmation letter from San Diego Natural History Museum, other institution or, if the search was in-house, a letter of verification from the PI stating that the search was completed.
   2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.

B. PI Shall Attend Pre-maintenance Meetings
   1. Prior to beginning any work that requires monitoring, the Applicant shall arrange a Pre-maintenance Meeting that shall include the PI, Maintenance Manager (MM) and/or Grading Contractor, Resident Engineer (RE), Building Inspector (BI), if appropriate, and MMC. The qualified paleontologist shall attend any grading/excavation related Pre-maintenance Meetings to make comments and/or

suggestions concerning the Paleontological Monitoring program with the Maintenance Manager and/or Grading Contractor.
   a. If the PI is unable to attend the Pre-maintenance Meeting, the Applicant shall schedule a focused Pre-maintenance Meeting with MMC, the PI, RE, MM or BI, if appropriate, prior to the start of any work that requires monitoring.
2. Acknowledgement of Responsibility for Curation (CIP or Other Public Projects)
   The applicant shall submit a letter to MMC acknowledging their responsibility for the cost of curation associated with all phases of the paleontological monitoring program.
3. Identify Areas to be Monitored
   a. Prior to the start of any work that requires monitoring, the PI shall submit a Paleontological Monitoring Exhibit (PME) based on the appropriate maintenance documents (reduced to 11x17) to MMC for approval identifying the areas to be monitored including the delineation of grading/excavation limits. Monitoring shall begin at depths below 10 feet from existing grade or as determined by the PI in consultation with MMC. The determination shall be based on site specific records search data which supports monitoring at depths less than ten feet.
   b. The PME shall be based on the results of a site specific records search as well as information regarding existing known soil conditions (native or formation).
   c. MMC shall notify the PI that the PME has been approved.
4. When Monitoring Will Occur
   a. Prior to the start of any work, the PI shall also submit a maintenance schedule to MMC through the RE indicating when and where monitoring will occur.
   b. The PI may submit a detailed letter to MMC prior to the start of work or during maintenance requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final maintenance documents which indicate conditions such as depth of excavation and/or site graded to bedrock, presence or absence of fossil resources, etc., which may reduce or increase the potential for resources to be present.
5. Approval of PME and Maintenance Schedule
   After approval of the PME by MMC, the PI shall submit to MMC written authorization of the PME and Maintenance Schedule from the MM.

4.7.1.3 During Maintenance

A. Monitor Shall be Present During Grading/Excavation/Trenching
   1. The monitor shall be present full-time during grading/excavation/trenching activities including, but not limited to mainline, laterals, jacking and receiving pits, services and all other appurtenances associated with underground utilities as identified on the PME that could result in impacts to formations with high and/or moderate resource sensitivity. **The Maintenance Manager is responsible for notifying the RE, PI, and MMC of changes to any maintenance activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the PME.**

2. The PI may submit a detailed letter to MMC during maintenance requesting a modification to the monitoring program when a field condition such as trenching activities that do not encounter formational soils as previously assumed, and/or when unique/unusual fossils are encountered, which may reduce or increase the potential for resources to be present.
3. The monitor shall document field activity via the Consultant Site Visit Record (CSVR). The CSVR's shall be faxed by the MM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion**), and in the case of ANY discoveries. The RE shall forward copies to MMC.

B. Discovery Notification Process
   1. In the event of a discovery, the Paleontological Monitor shall direct the contractor to temporarily divert trenching activities in the area of discovery and immediately notify the RE or BI, as appropriate.
   2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.
   3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.

C. Determination of Significance
   1. The PI shall evaluate the significance of the resource.
      a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required. The determination of significance for fossil discoveries shall be at the discretion of the PI.
      b. If the resource is significant, the PI shall submit a Paleontological Recovery Program (PRP) and obtain written approval of the program from MMC, MC and/or RE. PRP and any mitigation must be approved by MMC, RE and/or MM before ground disturbing activities in the area of discovery will be allowed to resume.
         (1). Note: For pipeline trenching projects only, the PI shall implement the Discovery Process for Pipeline Trenching projects identified below under "D."
      c. If resource is not significant (e.g., small pieces of broken common shell fragments or other scattered common fossils) the PI shall notify the RE, or BI as appropriate, that a non-significant discovery has been made. The Paleontologist shall continue to monitor the area without notification to MMC unless a significant resource is encountered.
      d. The PI shall submit a letter to MMC indicating that fossil resources will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that no further work is required.
         (1). Note: For Pipeline Trenching Projects Only. If the fossil discovery is limited in size, both in length and depth; the information value is limited and there are no unique fossil features associated with the discovery area, then the discovery should be considered not significant.

(2). Note, for Pipeline Trenching Projects Only: If significance cannot be determined, the Final Monitoring Report and Site Record shall identify the discovery as Potentially Significant.

D. Discovery Process for Significant Resources - Pipeline Trenching Projects
   The following procedure constitutes adequate mitigation of a significant discovery encountered during pipeline trenching activities including but not limited to excavation for jacking pits, receiving pits, laterals, and manholes to reduce impacts to below a level of significance.
   1. Procedures for documentation, curation and reporting
      a. One hundred percent of the fossil resources within the trench alignment and width shall be documented in-situ photographically, drawn in plan view (trench and profiles of side walls), recovered from the trench and photographed after cleaning, then analyzed and curated consistent with Society of Invertebrate Paleontology Standards. The remainder of the deposit within the limits of excavation (trench walls) shall be left intact and so documented.
      b. The PI shall prepare a Draft Monitoring Report and submit to MMC via the RE as indicated in Section 4.7.1.1-A.
      c. The PI shall be responsible for recording (on the appropriate forms for the San Diego Natural History Museum) the resource(s) encountered during the Paleontological Monitoring Program in accordance with the City's Paleontological Guidelines. The forms shall be submitted to the San Diego Natural History Museum and included in the Final Monitoring Report.
      d. The Final Monitoring Report shall include a recommendation for monitoring of any future work in the vicinity of the resource.

4.7.1.4 Night and/or Weekend Work

A. If night and/or weekend work is included in the contract
   1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the Pre-maintenance meeting.
   2. The following procedures shall be followed.
      a. No Discoveries
         In the event that no discoveries were encountered during night and/or weekend work, The PI shall record the information on the CSVR and submit to MMC via the RE via fax by 8AM on the next business day.
      b. Discoveries
         All discoveries shall be processed and documented using the existing procedures detailed in Section 4.7.1.3 - During Maintenance.
      c. Potentially Significant Discoveries
         If the PI determines that a potentially significant discovery has been made, the procedures detailed under Section 4.7.1.3 - During Maintenance shall be followed.
      d. The PI shall immediately contact the RE and MMC, or by 8AM on the next business day to report and discuss the findings as indicated in Section 4.7.1.3-

WORK PERFORMED 9/2013 - 3/2014

INTERIM AS-BUILT
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TIJUANA RIVER VALLEY
ENVIRONMENTAL MITIGATION
REQUIREMENTS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 14 OF 15 SHEETS

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NO._____

B, unless other specific arrangements have been made.

B. If night and/or weekend work becomes necessary during the course of maintenance
   1. The Maintenance Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.
   2. The RE, or BI, as appropriate, shall notify MMC immediately.

C. All other procedures described above shall apply, as appropriate.

4.7.1.5 Post Maintenance

A. Preparation and Submittal of Draft Monitoring Report
   1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Paleontological Guidelines which describes the results, analysis, and conclusions of all phases of the Paleontological Monitoring Program (with appropriate graphics) to MMC via the RE for review and approval within 90 days following the completion of monitoring,
      a. For significant paleontological resources encountered during monitoring, the Paleontological Recovery Program or Pipeline Trenching Discovery Process shall be included in the Draft Monitoring Report.
      b. Recording Sites with the San Diego Natural History Museum
      The PI shall be responsible for recording (on the appropriate forms) any significant or potentially significant fossil resources encountered during the Paleontological Monitoring Program in accordance with the City's Paleontological Guidelines, and submittal of such forms to the San Diego Natural History Museum with the Final Monitoring Report.
   2. MMC shall return the Draft Monitoring Report to the PI via the RE for revision or, for preparation of the Final Report.
   3. The PI shall submit revised Draft Monitoring Report to MMC via the RE for approval.
   4. MMC shall provide written verification to the PI of the approved report.
   5. MMC shall notify the RE or BI, as appropriate, of receipt of all Draft Monitoring Report submittals and approvals.

B. Handling of Fossil Remains
   1. The PI shall be responsible for ensuring that all fossil remains collected are cleaned and catalogued.

C. Curation of artifacts: Deed of Gift and Acceptance Verification
   1. The PI shall be responsible for ensuring that all fossil remains associated with the monitoring for this project are permanently curated with an appropriate institution.
   2. The PI shall submit the Deed of Gift and catalogue record(s) to the RE or BI, as appropriate for donor signature with a copy submitted to MMC.
   3. The RE or BI, as appropriate shall obtain signature on the Deed of Gift and shall

return to PI with copy submitted to MMC.
   4. The PI shall include the Acceptance Verification from the curation institution in the Final Monitoring Report submitted to the RE or BI and MMC.

D. Final Monitoring Report(s)
   1. The PI shall submit two copies of the Final Monitoring Report to MMC (even if negative), within 90 days after notification from MMC of the approved report.
   2. The RE shall, in no case, issue the Notice of Completion until receiving a copy of the approved Final Monitoring Report from MMC which includes the Acceptance Verification from the curation institution.

WATER QUALITY

Potential impacts to water quality would be reduced to below a level of significance through implementation of the following mitigation measures.

Mitigation Measure 4.8.1: Prior to commencement of any activity within a specific annual maintenance program, a qualified water quality specialist shall prepare an IWQA for each area proposed to be maintained. The IWQA shall be prepared in accordance with the specifications included in the Master Program. If the IWQA indicates that maintenance would impact a water pollutant where the existing level for that pollutant exceeds or is within 25 percent of the standard established by the San Diego Basin Plan, mitigation measures identified in Table 4.8-8 shall be incorporated into the IMP to reduce the impact to within the established standard for that pollutant.

Table 4.8-8
MITIGATION MEASURES FOR REDUCED POLLUTANT REMOVAL CAPACITY

Mitigation Measure	Pollutant Type						
	Bacteria	Metals	Nutrients	Pesticides	Sediment	TDS/ Chloride Sulfates	Trash
Remove kelp on beaches					●	●	
Sweep streets	●	●	●	●	●	●	●
Retrofit residential landscaping to reduce runoff	●	●	●		●		
Install artificial turf	●	●	●	●	●		●
Install inlet devices on storm drains		●	●		●		
Replace impermeable surfaces with permeable surfaces		●	●		●		●

Table 4.8-8 (cont.)
MITIGATION MEASURES FOR REDUCED POLLUTANT REMOVAL CAPACITY

Mitigation Measure	Pollutant Type						
	Bacteria	Metals	Nutrients	Pesticides	Sediment	TDS/ Chloride Sulfates	Trash
Install modular storm water filtration systems		●	●	●	●	●	●
Install storm water retention basins		●	●	●	●	●	●
Install catch basin media filters		●	●		●	●	●
Create vegetated swales	●	●	●	●	●	●	●
Restore wetlands	●	●	●	●	●	●	●
Install check dams		●			●		●

Mitigation Measure 4.8.2: No maintenance activities within a proposed annual maintenance program shall be initiated before the City's ADD Environmental Designee and state and federal agencies with jurisdiction over maintenance activities have approved the IMPs and IWQAs including proposed mitigation and BMPs for each of the proposed activities. In their review, the ADD Environmental Designee and agencies shall also confirm that the appropriate maintenance protocols have been incorporated into each IMP.

Mitigation Measure 4.8.3: Prior to commencing any activity where the IWQA indicates significant water quality impacts may occur, a pre-maintenance meeting shall be held on site with following in attendance: City's SWD, MM, MMC, and MC. A qualified water quality specialist shall also be present. At this meeting, the water quality specialist shall identify and discuss mitigation measures, protocols and BMPs identified in the IWQA that must be carried out during maintenance. After the meeting, the water quality specialist shall provide DSD with a letter indicating that the applicable mitigation measures, protocols and BMPs identified in the IWQA have been appropriately implemented.

WORK PERFORMED 9/2013 - 3/2014

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ENVIRONMENTAL MITIGATION
REQUIREMENTS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 15 OF 15 SHEETS

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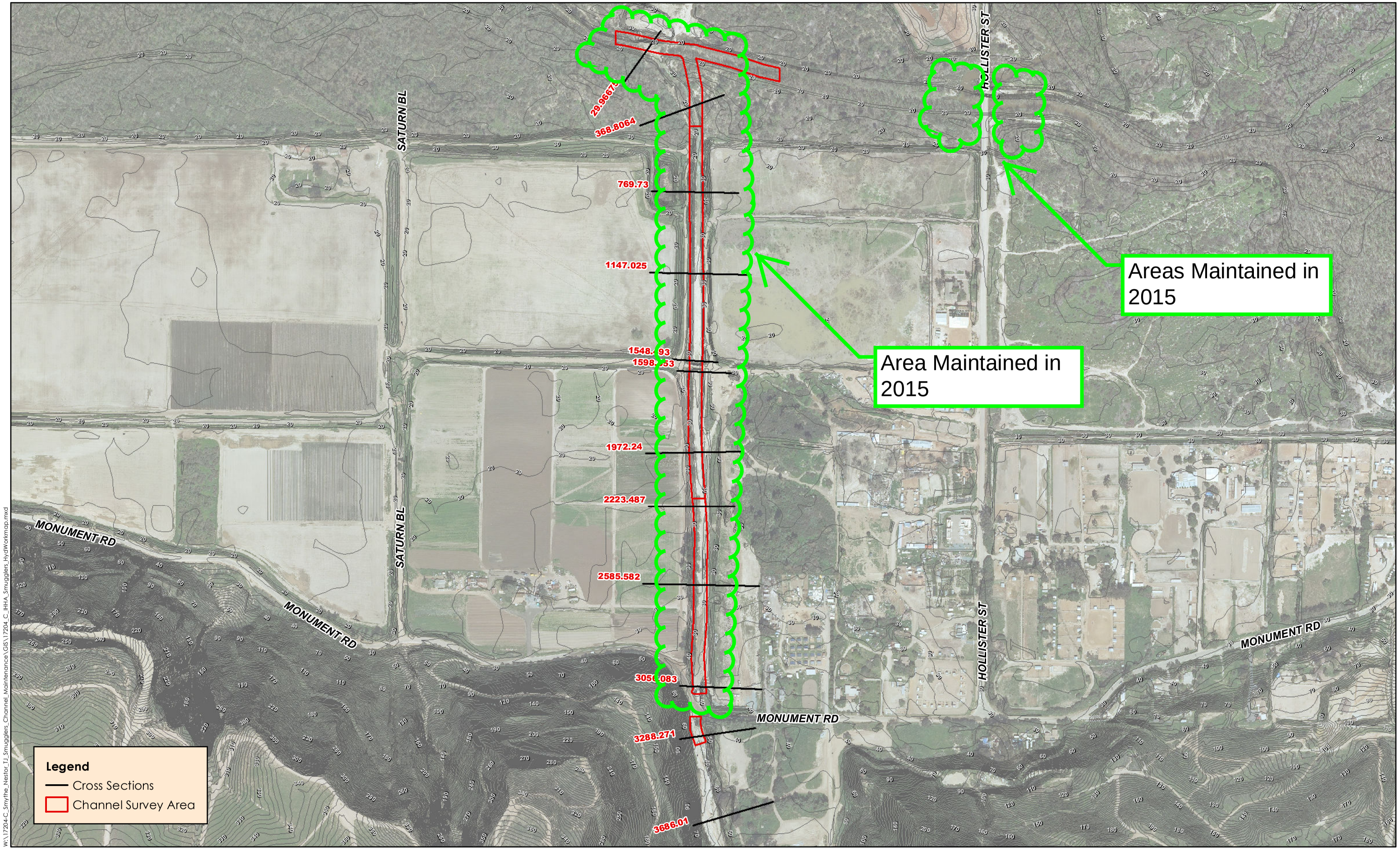
Appendix B
2015 Maintenance Area Exhibit



W:\17204-C_Smythe_Nestor_TJ_Smugglers_Channel_Maintenance\GIS\17204_C_IHHA_Smugglers_HydWorkmap.mxd

RICK ENGINEERING COMPANY

Scale in Feet
0 400 800
North

Date of Exhibit: 05.07.2015
DigitalGlobe Aerial Image: 04.2013

Smugglers Gulch Channel
IHHA Report - Hydraulic Workmap
17204-C

Appendix C
Rick Engineering Site Photos taken on May 5, 2016

ATTACHMENT 8 - SITE PHOTOS:

One site visit was conducted on May 5, 2016. The photos below were taken during the site visit:

1.

South of Monument Road viewing upstream at the County of San Diego owned portion of the Smugglers Gulch channel.

2.

Viewing North (downstream) at a triple corrugated pipe culvert under a private dirt road. Culvert has sediment, vegetation and debris obstructing the flow.

3.

Viewing North (downstream) of the Smugglers Gulch Channel.

4.

Viewing South (upstream) of the Smugglers Gulch Channel. Channel has accumulated sediment in this section since the 2015 maintenance, approximately 6 inches.

5.

At the confluence of Smugglers Gulch and the Tijuana River viewing East (upstream of Tijuana River). Sediment and ponding of water occur within this portion of the channel.

6.

At the confluence of Smugglers Gulch and the Tijuana River viewing South (upstream of Smugglers Gulch). Sediment and ponding of water occurs within this portion of the channel.

7.

Standing on the Hollister bridge crossing overlooking the Tijuana river; viewing West (downstream). Channel has ponded water and sediment deposition.

8.

Standing on the Hollister bridge crossing overlooking the Tijuana river; viewing East (upstream).